BIOLOLGICAL EVALUATION

for

Protected and Forest Service Sensitive Terrestrial Wildlife Species

GIBSONVILLE HEALTHYFOREST RESTORATIONPROJECT

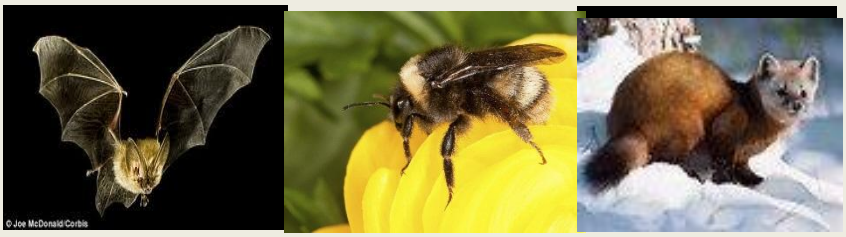
PROJECT LOCATION

Plumas County, California

Feather River Ranger District

Plumas National Forest

July 2016



Prepared by: /s/ Cindy K. Roberts Date: July 22, 2016

Cindy Roberts, District Staff Biologist

Summary

The Biological Evaluation (BE) provides a process to review all Forest Service planned, funded, executed, or permitted programs and activities for possible effects on regionally listed Forest Service Sensitive species (FSM 2672.42). This document only includes wildlife species (invertebrates, birds and mammals). Aquatic species (including invertebrates, amphibians and reptiles) are covered in a separate document.

SPECIES NOT CARRIED FORWARD

Although the following species are found on the Plumas National Forest, they are not found on the Feather River Ranger District; therefore they will not be discussed further in this document:**Swainson's hawk, Sierra Nevada red fox** and **Greater sandhill crane.**

Although the following species are found on the Feather River Ranger District of the Plumas National Forest, there is no known habitat and/or no observations and/or out of the elevational range for the following species within the Gibsonville Project area; therefore they will not be discussed further in this document:**Bald eagle,American Peregrine Falcon, Pacific fisher,North American wolverine** and**Valley Elderberry Longhorn Beetle.**

The following species are found on the Plumas National Forest and there is potentially suitable habitat within the Gibsonville Project. However, based on the limited habitat available, and/or no detections from multiple surveys, and/or that proposed treatments would not impact habitat:therefore they will not be discussed further in this document:**Great Gray Owl and Willow flycatcher.**

SPECIES CARRIED FORWARD

Alternative A (No Action)

It is my determination that the proposed project may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viabilityfor the**California spotted owl, Northern goshawk, Pacific marten, Townsend's big-eared bat, Fringed bat, Pallid bat**and **Western bumble bee** in the planning area.

Alternative B (proposed action) and Alternative C (California spotted owl alternative)

It is my determination that the proposed project may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viabilityfor the**California spotted owl, Northern goshawk, Pacific marten, Townsend's big-eared bat, Fringed bat, Pallid bat**and **Western bumble bee**in the planning area.

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1. INTRODUCTION

Management of species habitat, and maintenance of a diversity of animal communities, is an important part of the mission of the Forest Service (Resource Planning Act of 1974, National Forest Management Act of 1976). Management activities on National Forest System (NFS) lands are planned and implemented so that they do not jeopardize the continued existence of threatened or endangered species, proposed, candidate or lead to a trend toward listing or loss of viability of Forest Service Sensitive, specified in the 1982 Planning Rule (36 CFR 219).

The purpose of this Biological Assessment and Biological Evaluation (BA/BE) is to review the proposed United States. Forest Service (USFS) action in sufficient detail to determine if the proposed action, GibsonvilleFuels Reduction Project, will result in a trend toward federal listing of Candidate and Forest Service Sensitive species, to document effects on Proposed species in order to determine if conferencing is required, and to document effects on Threatened and Endangered species to determine if consultation is required.The following **Table 1** lists Threatened, Endangered, Proposed, Candidate species and species of Concern, for which habitat availability and suitability was considered for this project:

Biological Assessment (BA) is prepared to determine the effects of proposed projects on species listed by the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service as Endangered, Threatened or Proposed for listing. It is prepared in accordance with legal requirements set forth under Section 7 of the Endangered Species Act (19 U.S.C. 1536 {c}), 50 CFR 402, and standards established in Forest Service Manual (FSM) direction (FSM 2672.42).

Biological Evaluation (BE) provides a process to review all Forest Service planned, funded, executed, or permitted programs and activities for possible effects on regionally listed Forest Service Sensitive species (FSM 2672.42). This document combines the BA and BE for fish and wildlife (including invertebrates, amphibians, reptiles, birds, and mammals).

1.1 Threatened and Endangered species

Those species listed under the federal Endangered Species Act. Threatened species are likely to become Endangered throughout all or a significant portion of their range (16 United States Code [USC] 1532).

1.2 Proposed species

A Proposed species is any species that is proposed in the Federal Register to be listed as a Threatened or Endangered species under the Endangered Species Act (50 Code of Federal Regulations [CFR] 402.03).

1.3 Candidate species

Those species identified as a "candidate" for listing as a Proposed species. The U.S. Fish and Wildlife Service recently changed its policy on Candidate species—the term "Candidate" now strictly refers to species for which the service has enough information on file to warrant or propose listing as Endangered or Threatened.

Table 1. Threatened, Endangered, Proposed, Candidate and Forest Service Sensitive wildlife species that potentially occur on the Plumas National Forest.

Species Common and (Scientific Name)	Species Status*	Habitat or Ecosystem Component	Analysis Category**
Birds			
Bald eagle (*Haliaeetus leucocephalus*)	USFWS: BCC USFS: S DFG: SE	Large trees adjacent to riverine and lacustrine	1
California spotted owl (*Strix occidentalis occidentalis*)	**USFWS: BCC USFS: S, MIS DFG: SSC**	**Late Seral Closed Canopy Coniferous Forest**	**3**
Greater sandhill crane (*Grus canadensis tabida*)	USFS: S DFG: ST	Open habitats (grasslands and croplands), shallow lakes, fresh emergent wetlands	1
Great gray owl (*Strix nebulosa*)	USFS: S DFG: SE	Late Seral Closed Canopy Coniferous Forest adjacent to wet meadows	2
Northern goshawk (*Accipiter gentilis*)	**USFS: S DFG: SSC**	**Late Seral Closed Canopy Coniferous Forest**	**3**
Willow flycatcher (*Empidonax trailii brewsteri*)	USFWS: BCC USFS: S DFG: SE	Riparian with Dense Willows	2
Mammals			
Pacific marten (*Martes caurina*)	**USFS: S**	**Late Seral Closed Canopy Coniferous Forest**	**3**
North American wolverine (*Gulo gulo luscus*)	USFWS: FP USFS: S DFG: ST	Late Seral Closed Canopy Coniferous Forest	1
Fisher (*Pekania pennanti*)	USFWS: FC USFS : S DFG : SSC	Late Seral Closed Canopy Coniferous Forest	2
Pallid bat (*Antrozous pallidus*)	**USFS: S DFG: SSC**	**Open, Dry Habitats with Rocky Area**	**3**
Townsend's big-eared bat (*Corynorhinus townsendii*)	**USFS: S DFG: SSC**	**Mesic Habitats**	**3**
Fringed myotis (*Myotis thysanodes*)	**USFS: S**	**Hardwood-conifer Open Canopy Forest**	**3**
Invertebrates			
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	USFWS: FT	Elderberry trees (*Sambucus* spp.)	1
Western bumble bee (*Bombus occidentalis*)	**USFS: S**	**Access to Flowering Plants and Abandoned Rodent Burrows**	**3**

*__USFWS: FE__ =Federal Endangered, **FT** = Federal Threatened, **FP** = Federal Proposed, **FC** = Federal Candidate, **BCC** = Birds of Conservation Concern, **SOI** = Species of Interest.
USFS: S = U.S. Forest Service - Sensitive, **MIS** = U.S. Forest Service – Management Indicator Species,
Note: Sensitive Species identified for analysis are those included on a proposed updated USFS Region 5 update with an implementation date of July 3, 2013. Projects with NEPA decisions after this date are required to use this updated list.
DFG: SE = State Endangered, **ST** = State Threatened, **DFG : FP** = State Fully Protected, **DFG : SSC** = State Species of Special Concern,

** **Category 1:** Species whose habitat is not in or adjacent to the aquatic or terrestrial wildlife analysis areas and would not be affected by the project.
Category 2: Species whose habitat is in or adjacent to the aquatic or terrestrial wildlife analysis areas, but would not be either directly or indirectly affected by the project.
Category 3: Species whose habitat would be either directly or indirectly affected by the project.

1.4 Forest Service Sensitive species

Those species, generally federal Candidates for listing or Species of Concern, that have been designated by the Forest Service as needing special management attention because of viability concerns. The Forest Service manages for these species to ensure they will not require listing as Threatened or Endangered.

Although the following species are found on the Plumas National Forest, they are not found on the Feather River Ranger District; therefore they will not be discussed further in this document:**Greater sandhill crane.**

Although the following species are found on the Feather River Ranger District of the Plumas National Forest, there is no known habitat and/or no observations and/or out of the elevational range for the following species within the Gibsonville Project area; therefore they will not be discussed further in this document:**Bald eagle, Fisher,North American wolverineand Valley elderberry longhorn beetle,**

The following species are found on the Plumas National Forest and there is potentially suitable habitat within the Gibsonville Project. However, based on the limited habitat available due to the elevational, and/or no detections from surveys, and/or that proposed treatments would not impact habitat: therefore they will not be discussed further in this document: **Willow flycatcher and Great gray owl**.

> **Willow flycatcher** was omitted from further discussion because: 1) there is little potentially suitable habitat; 2) surveys were conducted with no detections, 3) proposed treatments are at the higher end of the species elevational range; 4) most potentially suitable riparian habitat adjacent to treatments is within an area of human disturbance; 5) potentially suitable habitat is on private lands; and 6) proposed treatments would benefit any potential habitat within the project area.
>
> **Great gray owl**was omitted from further discussion because: 1) surveys to protocol were conducted over three years with no detections; 2)the limited amount of suitable habitat would be more likely for foraging but not for nesting; 3) design features would protect habitat for the species if they were within the area but not detected; and 4) proposed treatments would benefit any potentiallysuitable habitat within the project area.

The following species are found on the Feather River Ranger District on the Plumas National Forest and/or there is suitable habitat within the Gibsonville Project analysis area.Effects to these species as a result of implementing the proposed Gibsonville Project are analyzed and discussed below:**California spotted owl, Northern goshawk, Pacific marten, Pallid bat**, **Townsend's big-eared bat, Fringedmyotis andWestern bumble bee.**

Several Threatened and Endangered (T&E) species identified in the list of T&E species provided by the "Federal Endangered and Threatened Species that may be affected by Projects in the Plumas National Forest", accessed via USFWS web page http://www.fws.gov/sacramento/ES_Species/Lists/es_species_lists-overview.htm. The following have been eliminated from further analysis based onlack of species distribution, and/or no occurrences and/or no habitat.

- **Gray wolf** (*Canis lupus*)

2. CONSULTATION TO DATE

The U.S.Fish and Wildlife Service (USFWS) species list for the Plumas National Forest was formally issued on January 31, 2008 (USFWS reference 1-1-03-SP-1810) and is since updated for projects by computer database (on file at District office). This list fulfills the requirements to provide a current species list pursuant to Section 7(c) of the Endangered Species Act, as amended (on file). Threatened,

Endangered, Proposed and Candidate species with potential to occur in the project area were reviewed to determine any possible effects of the proposed Gibsonville Project. There are no species requiring informal or formal conferencing or consultation.

3. CURRENT MANAGEMENT DIRECTION

Management area specific and species-specific direction and prescriptions will be included in the species discussions below. Direction is also found under other areas (e.g., timber management) that directly or indirectly affect animal species and/or their habitats. Current management direction relevant to the proposed action as it affects Threatened, Endangered and Forest Service Sensitive species can be found in:

- Forest Service Manual and Handbooks (FSM/H 2670)
- National Forest Management Act (NFMA 1976)
- Endangered Species Act (ESA 1976)
- National Environmental Policy Act (NEPA 1969)
- Migratory Bird Treaty Act of 1918 as amended (MBTA)
- Plumas National Forest Land and Resource Plan (LRMP 1988)
- Plumas National Forest (FEIS/ROD for the LRMP 1988)
- Sierra Nevada Forest Plan Amendment Final Environmental Impact Statement and Record of Decision (SNFPA FEIS/ROD 2001)
- Sierra Nevada Forest Plan Amendment Final Supplemental Environmental Impact Statement and Record of Decision (SNFPA FSEIS/ROD 2004)
- Regional Forester policy and management direction
- Species specific Recovery Plans which establish population goals for recovery of those species
- Species management plans, guides or conservation strategies

3.1 National Environmental Policy Act (NEPA 1969)

The National Environmental Policy Act (NEPA) is a United States environmental law that established policy (e.g. environmental effects of proposed federal actions) and the President's Council on Environmental Quality (CEQ).

3.2Endangered Species Act (ESA 1973)

The Endangered Species Act of 1973 (16 USC 1531 et seq.) requires that any action authorized by a federal agency not be likely to jeopardize the continued existence of a threatened or endangered (TE) species, or result in the destruction or adverse modification of habitat of such species that is determined to be critical. Section 7 of the ESA, as amended, requires the responsible federal agency to consult the USFWS and the National Marine Fisheries Service concerning TE species under their jurisdiction. It is Forest Service policy to analyze impacts to TE species to ensure management activities are not be likely to jeopardize the continued existence of a TE species, or result in the destruction or adverse modification of habitat of such species that is determined to be critical. This assessment is documented in a Biological Assessment (BA) and is summarized or referenced in this Chapter.

3.3 National Forest Management Act (NFMA 1976)

National Forest Management Act (NFMA 1976) and Code of Federal Regulations (36, 40 & 50 CFR)The National Forest Management Act (NFMA 1976) includes direction to preserve and enhance the

diversity of plant and animal communities, including endemic and desirable naturalized plant and animal species, so that the diversity is at least as great as that which would be expected in a natural forest and the diversity of tree species is similar to that existing in the planning area (36 CFR 219.26 and 219.27). One of the key ways this direction is implemented is through the NFMA regulations concerning species viability, (36 CFR 219.19).

3.4Forest Service Manual and Handbooks (2670)

FSM/FSH 2670: Forest Service Sensitive (FSS) species are plant species identified by the Regional Forester for which population viability is a concern. The Forest Service develops and implements management practices to ensure that rare animals do not become threatened or endangered and ensure their continued viability on national forests. It is Forest Service policy to analyze impacts to sensitive species to ensure management activities do not create a significant trend toward federal listing or loss of viability. This assessment is documented in a Biological Evaluation (BE) and is summarized or referenced in this Chapter.

FSM/FSH 2670.31: Places top priority on conservation and recovery of Endangered, Threatened, and Proposed species and their habitats through relevant National Forest System, State and Private Forestry, and Research activities and programs. Avoid all adverse impacts on Threatened and Endangered species and their habitat except when it is possible to compensate adverse effect totally through alternatives identified in a biological opinion rendered by the U.S. Fish and Wildlife Service (USFWS); when an exemption has been granted under the act, or when the USFWS biological opinion recognizes an incidental taking. Initiate consultation or conference with the USFWS when the Forest Service determines that proposed activities may have an adverse effect on Threatened, Endangered, or Proposed Species or when Forest Service projects are for the specific benefit of a Threatened or Endangered species. Identify and prescribe measures to prevent adverse modification or destruction of critical habitat and other habitats essential for the conservation of Endangered, Threatened, and Proposed species. Protect individual organisms or populations from harm or harassment as appropriate.

FSM/FSH 2670.32: As part of the National Environmental Policy Act process, review programs and activities, through a biological evaluation, to determine their potential effect on sensitive species and avoid or minimize impacts to species whose viability has been identified as a concern. If impacts cannot be avoided, analyze the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole. Establish management objectives in cooperation with the States when a project on National Forest System lands may have a significant effect on sensitive species population numbers or distribution.

3.5Plumas National Forest-Land and Resource Management Forest Plan (1988)

The 1988 Plumas National Forest Land and Resource Management Plan (PNF LRMP, commonly referred to as the "Forest Plan"), as amended by the 2004 SNFPA final supplemental EIS Record of Decision, guides the proposed action and alternatives. The PNF LRMP provides Forest specific information on how TES species will be managed. These include forest wide goals and policies for Wildlife, Fish and Sensitive Plants (p. 4-4) and Riparian Areas (p. 4-7), Wildlife objectives (p. 4-14, 4-15, and 4-19), forest wide direction and standards and guidelines for Wildlife, Fish and Sensitive Plants (p. 4-29 through 4-32). Management Area specific and species-specific direction and prescriptions will be included in the species discussions below. Direction is also found under other areas (e.g., Timber management) that directly or indirectly affect animal species and/or their habitats. This direction is incorporated by reference. The PNF LRMP provides management guidelines that incorporate Regional direction for each species. Current TES

and wildlife direction can be found in the PNF LRMP and EIS (USDA 1988a and 1988b), as amended by SNFPA FSEIS ROD (USDA 2004), for Wildlife, Fish, Riparian Ecosystems and riparian-dependent wildlife species.

3.6Sierra Nevada Forest Plan Amendment Final Supplemental EIS (2001 &2004)

In January 2004, the Regional Forester signed the SNFPA final supplemental EIS Record of Decision, which replaced the 2001 Record of Decision on the SNFPA final EIS.**Appendix A** provides a list of standards and guidelines, that are a subset of all applicable Land and Resource Management Plan direction, and this project is being analyzed for consistency to all applicable Forest Plan standards and guidelines for terrestrial and aquatic wildlife, including Aquatic Management Strategy (AMS) Goals and Riparian Conservation Objectives (RCOs, USDA 2004).

3.7Rapid Landscape Analysisfor Little Grass Valley Reservoir, Lost Creek, Slate Creek, and Canyon Creek Watersheds(USDA 2013a)

This landscape assessment is intended to consider existing conditions to identify resource management objectives, strategies, and/or actions that will achieve the desired conditions outlined in the forest plan for the subject watersheds. Desired conditions and action objectives/strategies/actions can be used in subsequent project-level environmental documents to establish the project purposes and needs.

3.8Insect and Disease Evaluation of the Sacketts(Gibsonville) Project(USDA 2013b)

On September 11, 2013, Danny Cluck, Forest Health Protection Entomologist, conducted a field evaluation of the Sackettts (Gibsonville) project. The objective of the visit was to evaluate current stand conditions, determine the impacts of forest insects and diseases on management objectives and discuss treatment alternatives.

4. PROPOSED ACTION

The Forest Service proposes to reduce the risk of wildfire, to protect, restore, and enhance forest ecosystem components (i.e., streams, meadows, aspen areas) in the vicinity of Gibsonville, California. A combination of hazard tree removal, forest health, and fuels reduction treatments are proposed on **1,200acres** of Forest Service system lands. These actions are proposed to be implemented on the Feather River Ranger District of the Plumas National Forest.

4.1 Project Location

The project area is located approximately 6-8 miles northeast of La Porte, CA, in and around the historic townsite of Gibsonville. County Road 511 (Quincy-La Porte Road) traverses the project area.The legal description of the project area is portions of Mount Diablo Meridian, California; T22N, R9E, Sections 25, 35 and 36; and T22 N, R10E, Sections 17, 19, 20, 29 and 30.Refer to **Figure 1,**vicinity map.

4.2 Purpose and Need

The Healthy Forests Restoration Act (HFRA) of 2003 authorizes the Forest Service to implement hazardous fuel reduction projects to reduce wildfire risk to at-risk public lands; to enhance efforts to protect watersheds and address threats to forest health, including catastrophic wildfire, across the landscape; and to protect, restore, and enhance forest ecosystem components, to promote the recovery of threatened and endangered species, improve biological diversity, and enhance productivity and carbon sequestration.

The purpose of the project is to retain and restore the ecological resilience of NFS lands, while providing for a broad range of services to humans and other organisms. Ecological resiliency refers to all stages of forest development. Not only the ecosystem's ability to absorb small drivers and stressors (disturbances like wildfire, insects and diseases) and prevent them from amplifying into larger ones, but also its capacity to recover afterwards.Specific purposes of the project are to:

- Remove hazard trees along roadways and from within the Gibsonville townsite to make these areas safer and increase roadside viewing distances for motorists, local residents, recreationists and other forest users;
- Thin vegetation to increase visibility and protect the Gibsonville townsite;
- Thin vegetation to release aspen from conifer suppression;
- Thin vegetation to restore meadow potential zones;
- Reduce ground, ladder and crown fuels by thinning trees and brush, thereby decreasing the likelihood of a severe wildfire spreading to private lands and structures or into California spotted owl and/or goshawk habitat;
- Utilize removed material – timber and smaller trees – to create an economic benefit locally and generate partial funding for the required noncommercial thinning and burning fuel treatments;
- Remove invasive plants from the project area.

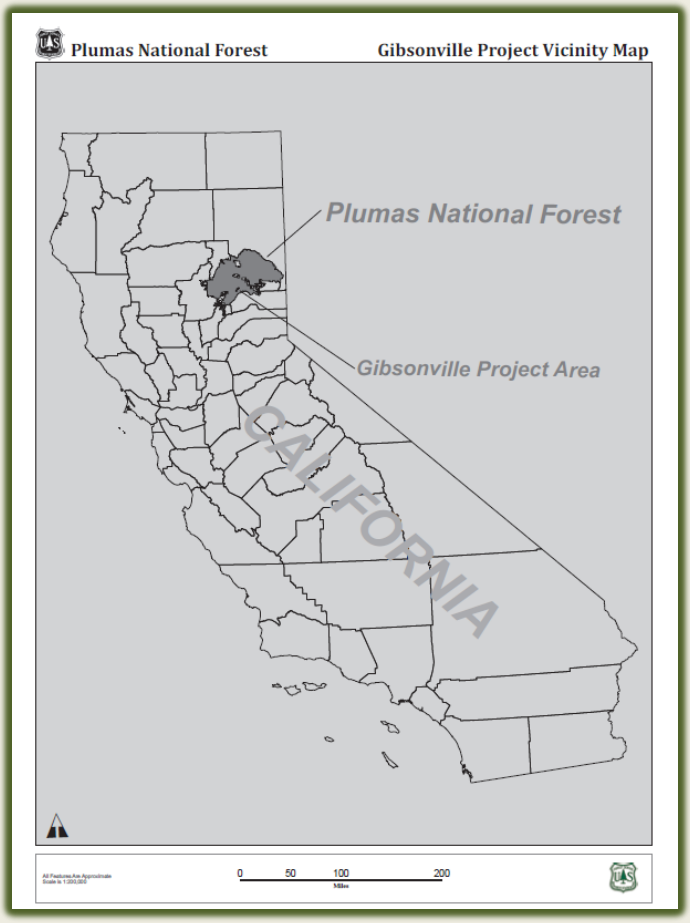

Figure 1. Gibsonville Project vicinity map.

4.3 Project Design Features

This project will comply with the directions, and standards and guidelines within the Plumas National Forest LRMP as amended by the 2004 SNFPA FSEIS and ROD. In addition to measures included in the project description, the following resource protection measures are included as part of the proposed project design. Implementation of the following Resource Protection Measures would meet Forest Service Management Direction and are incorporated in the proposed action. Refer topages 36-48 of the 2004 SNFPA ROD for a complete list of the management direction for Desired Conditions, which are statements describing a common vision for a specific land area such as "California Spotted Owl Protected Activity Centers". Refer topages 49-66 of the 2004 SNFPA ROD for a complete list of the management direction for Standard and Guidelineswhich apply to all land allocations such as "Habitat Connectivity for Old Forest Associated Species".

C and B Provisions/Clauses

All standard contract practices would be applied (timber sale contract B-provisions) as would some additional C-provisions and site specific prescription recommendations.

- Recommended mitigations associated with vegetation management would be designed to reduce logging damage to residual trees, reduce fuels, and reduce opportunities for infection of trees by fungal disease or insect attack. Recommended mitigations include: 1) minimizing logging in the spring when bark is loose and trees are more susceptible to logging wounds; 2) removal of small trees damaged beyond repair in harvesting operations, particularly in thinning units; 3) no chainsaw thinning in plantations from January through July to minimize bark beetles (*Ips*spp.) attack. 4) no removal of specially identified trees (e.g. marked survey trees, superior genetics trees, and/or proven rust.
- **C6.24-B6.24** Protection of Habitat of Threatened and Endangered Species (TEPS) Species (10/78): Location of areas needing special measures for protection of animals (or plants) as Threatened, Endangered, Proposed or Species under the ESA of 1973 and R5 Sensitive Species are shown on map and or discussed in this document. If protection measures prove inadequate, if other such areas are discovered, or if new species are listed on the Endangered Species List, FS may either cancel under **C8.2** or unilaterally modify this contract to provide additional protection regardless of when such facts become known. Discovery of such areas by either party shall be promptly reported to the other party.
- **CT6.313** Limited Operating Period (1/84): Except when agreed otherwise, Purchaser's operations shall be "limited" as described within this document.
    - If new species are listed or a T&ES is discovered within an area in which they may be adversely affected by activities, protection measures such as LOPs will be implemented as recommended by a qualified biologist, as appropriate for the species. The dates and reason for delaying harvest should be included in **C6.313** Limited Operating (1/84), or other language that is appropriate for the type of contract.
- **C6.7 - C6.705** Logs not meeting utilization standards shall be used to meet the Land and Resource Management Plan as amended requirements. Logs should be evenly distributed within the units (stands) to the extent possible.

Best Management Practices

Refer to Gibsonville –Hydrology Report and the Aquatic Biological Evaluation and Biological Assessment 2016 (USDA 2016a and 2016b) for Design Features, discussion and appendices.

Limited Operating Periods

Limited Operating Periods (LOPs) are designed to reduce potential harm and or harassment to aquatic and semi-aquatic organisms during critical seasons, primarily nesting and their offspring seasons, when animals are most vulnerable to activities could result in failed reproductive attempts. If management objectives cannot be met by implementing the LOPs identified, a wildlife biologist will be consulted to determine more specific areas and kind of activities that may be pursued. The biologist may recommend removing an LOP, if new information arises.

S&GL #75-79 and 88: Alternatives would be implemented in compliance with all rules and regulations governing land management activities, including the use of appropriate LOPS identified in **Table 2**. Limited Operating Periods are listed in the 2004 SNFPA ROD, pages A-54, A-58, A-60, A-61 and A-62.

Table 2. Limited Operating Periods by Species and Location.

Species	Location	Limited Operating Period
California Spotted Owl	Within ¼ mile of a protected activity center	March 1 – August 15
Northern Goshawk	Within ¼ mile of territory or active nest site	February 15 – September 15
Pacific Marten	100 acre den site buffer	May 1 – August 1
Pallid Bat Townsend's big-eared Bat Fringed Myotis	Within ¼ mile of maternity and other roosts	April 1 – October 31

PROTECTION MEASURE:

California spotted owl: Limited Operating Period (LOP) of no activity between March 1 and August 15. The LOP may be lifted if approved by the district biologist and if surveys determine non-breeding.* Additional LOPs may apply if new activity centers are located within 0.25 miles of proposed treatments.

Alternatives B&C
Unit 565 - Roadside Hazard Tree Removal and HCPB and Biomass (borders **SIE0046**)
Unit 2 – Mastication or HCPB or UB (within **SIE0046**)
Units 1, 559 and 569 - HCPB and UB (within **SIE0046**)
Unit 612 - HCPB and UB (borders **SIE0046**)
Unit R01 - Meadow/riparian restoration (within**SIE0046**)

Alternative B
Unit 610 - VDT 40% (potential new PAC or part of **SIE0046**)
Units 555, 551, 570, 557 and 560 – VDT 40% (borders **SIE0046)**

Northern goshawk: Limited Operating Period (LOP) on of no activity between February15and September 15.The LOP may be lifted if approved by the district biologist.All proposed LOPs are within NOGO PACs. * Additional LOPs may apply if new activity centers are located within 0.25 miles of proposed treatments. Applies to Alternatives B and C.

PAC T55	**PAC T58**
Unit 2 - Mastication Units 1 and 569 - HCPB and UB	Unit 643 - Roadside Hazard Tree Removal Unit 647 - Mastication or HCPB or UB Units 728 and 730 - Mastication and UB Units 649 and 732 - HCPB and UB

Pacific Marten: No Limited Operating Period proposed. No den sites were located.

Bats: No Limited Operating Period are proposed. No roosts were located. If roosts are located they may require protection measures.

Surveys

PROTECTION MEASURE:

Surveys for CSO and NOGO are valid the following 2 years upon initial completion. Example: surveysconducted in 2015 and 2016 are good through 2018. May require additional surveys.
California spotted owl: Surveys would be required in PACs in spring, prior to activities.
Northern goshawk: Surveys would be required in PACs in early summer, prior to activities.

Roads

California Spotted Owl PAC SIE0046 and Northern goshawk PAC T55:
Alternative B: Obliterate 0.9 miles of new temporary road construction and 0.3 miles of existing temporary road reconstruction, post-treatment.
Alternative C: Obliterate 0.3 miles of existing temporary road reconstruction, post-treatment.

Riparian Conservation Area (RCA)

The following follows the Riparian Conservation Area (RCA), Direction and Standards and Guidelines, as established in the SNFPA 2004.

PROTECTION MEASURE: The Feather River Aquatic and Hydrology department identified riparian areas with moderate to heavy concentrations of fine to small fuels. Fuels reduction treatments are proposed to be implemented within the RCA's. RCA's buffers are identified in **Table 3** by treatment type and the allowable treatment with its associated horizontal buffer.The 2004 Framework guidelines include meeting sixRiparian Conservation Objectives (RCOs). To describe how this project's proposed timber harvest and fuel treatments meet these objectives, an RCO analysis is provided inGibsonville - Aquatic BE/BA 2016 and Hydrology Report 2016.

Table 3. Treatment Riparian Conservation Area (RCA) buffers for the Gibsonville Project, including additional conservation measures for the SNYLF.

Treatment Type	Ephemeral and Intermittent Streams*	Perennial	Springs	Meadow
Variable Density Thinning (VDT)	Equipment exclusion zone**		Within stream buffers or as identified.	To meadow edge.
	75 ft. buffer.	150 ft. buffer.		
Aspen Release	10 ft. buffer.= no treatment		Within stream buffers or as identified.	To meadow edge.
Mastication	Equipment exclusion zone.		Within stream buffers or as identified.	To meadow edge. Minimize the amount of slash into meadow.
	50 ft. buffer	75 ft. buffer.		
Roadside Hazard	Equipment exclusion zone.		Within stream buffers or as identified.	N/A
	75 ft. buffer.	150 ft. buffer.		
Biomass Removal	*Biomass removal is a possible secondary treatment for VDT, Mastication or Roadside Hazard. *Apply similar buffers. For example VDT buffer for perennial streams is 150 ft. *Equipment exclusion zone within these buffers.		Within stream buffers or as identified.	To meadow edge.
HandCut HandPile Burn	*May hand cut up to 10" DBH within entire riparian allocation area. *Piles should be at least 25 ft. from the edge of stream bank or spring. *Piles may be ignited independent of an underburn. *Directional light piles so critters within pile may escape.			To meadow edge.

<table>
<tr><th>Treatment Type</th><th>Ephemeral and Intermittent Streams*</th><th>Perennial</th><th>Springs</th><th>Meadow</th></tr>
<tr><td rowspan="2">Variable Density Thinning (VDT)</td><td colspan="2">Equipment exclusion zone**</td><td rowspan="2">Within stream buffers or as identified.</td><td rowspan="2">To meadow edge.</td></tr>
<tr><td>75 ft. buffer.</td><td>150 ft. buffer.</td></tr>
<tr><td>Meadow Restoration</td><td colspan="4">*May hand cut up to 16 inches in DBH within entire riparian allocation area regardless the type of stream or if it’s a spring. The hand cutting limits also applies to treatment within meadows.
*Piles should be at least 25 ft. from the edge of stream bank or spring. It’s fine to pile within meadows. Burn piles may be ignited independent of an underburn.
*Do not remove riparian vegetation.</td></tr>
<tr><td>Riparian Restoration</td><td colspan="4">*May hand cut up to 16 inches in DBH within entire riparian allocation area regard less the type of stream or if it’s a spring. The hand cutting limits also applies to treatment within meadows.
*Piles should be at least 25 ft. from the edge of stream bank or spring. It’s fine to pile within meadows. Burn piles may be ignited independent of an underburn.
*Meadow&Riparian: May hand cut conifers up to 16 inches in DBH inside and out to 75ft from edge will be felled. May pile within meadow.
*Do not remove riparian vegetation.</td></tr>
<tr><td>Underburn</td><td colspan="4">*Underburn will be allowed within the RCAs.
*Fire will be ignited no closer than 150 ft. away from any stream, spring, and meadow allowed to back into these features under the ideal conditions for underburning.</td></tr>
<tr><td colspan="5">Additional required “Conservation Measures” for the Sierra Nevada yellow-legged frog.</td></tr>
<tr><td>Aspen Release</td><td colspan="4">*EndlineOut Material within 82 ft. for all perennial or intermittent streams with or without EEZ buffer.</td></tr>
<tr><td>VDT</td><td colspan="4">*Equipment Exclusion Zone = 82 ft buffer for all perennial or intermittent streams.</td></tr>
<tr><td>Mastication</td><td colspan="4">*Equipment Exclusion Zone = 82 ft buffer for all perennial or intermittent streams.</td></tr>
<tr><td>Roadside Hazard</td><td colspan="4">*Fell and leave any hazard trees with 82 ft of perennial or intermittent streams.
*Directionally fell trees away from streams and do not endline or drag through streams.</td></tr>
<tr><td>Underburn</td><td colspan="4">*Fire Exclusion Zone = 82 ft buffer for all perennial or intermittent streams.
*Monitor and actively prevent entry within 82 ftexclusion buffer.
*DO NOT construct handline within 82 ft of perennial or intermittent streams.</td></tr>
</table>

*Incudes Alder but go with whatever is greater. **EEZ= Equipment Exclusion Zone.

Hardwoods

SNFPA 2004, S&GL#23: During mechanical vegetation treatments, prescribed fire, and salvage operations, retain all large hardwoods (≥ 12 inch dbh) on the westside except where: (1) they pose an immediate threat to human life or property or (2) losses of large trees are incurred due to prescribed or wildland fires.

PROTECTION MEASURE: Retain all hardwoods, ≥ 10 inch dbh,where feasible.

Large Trees

SNFPA 2004, S&GL#6: Design projects to retain all live trees ≥30 inches dbh, exceptions allowed for safety and/or operability. Minimize impacts to ≥30 inch trees as much as practicable.

PROTECTION MEASURE: Protect and retain large trees≥ 30 inches dbh. During harvest activities ensure that fuels are clear from around large trees without damaging the tree. Prior to underburning, fuels loads would be removed or reduced around large trees which could be lost due to underburn activities.

Snags

SNFPA 2004, S&GL#11: Use snags larger than 15 inches dbh to meet this guideline. Snags should be clumped and distributed irregularly across the treatment units. Consider leaving fewer snags strategically located in treatment areas within the WUI and DFPZs. While some snags will be lost due to hazard

removal or use of prescribed fire, consider these potential losses during project planning to achieve desired snag retention levels.

- Determine snag retention levels on an individual basis. Design projects to sustain across the landscape a generally continuous supply of snags and live decadent trees suitable for cavity nesting wildlife. Retain some mid and large diameter live trees that are currently in decline, have substantial wood defect, or have desirable characteristics (teakettle branches, large diameter broken top, large cavities in the bole) to serve as future replacement snags and to provide nesting structure.
- When determining snag retention levels, consider land allocation, desired condition, landscape position, and site conditions (such as riparian areas and ridgetops) avoiding uniform distribution across large areas. During project-level planning, consider the following guidelines for large-snag retention:
- In westside mixed conifer and ponderosa pine types, four of the largest snags per acre.
- In the red fir forest type, six of the largest snags per acre.
- In westside hardwood ecosystems, four of the largest snags per acre (hardwood or conifer).
    - Where standing live hardwood trees lack dead branches, six of the largest snags per acre to supplement wildlife needs for dead material.

PROTECTION MEASURE: Retain existing snags, 15" dbh or greater, where feasible. During harvest activities ensure that fuels are clear from around snags. Prior to underburning, fuels loads would be removed or reduced around snags which could be lost due to underburn activities.

Down Wood

SNFPA 2004, S&GL#10: Determine down woody material retention levels on an individual project basis. Within Westside vegetation types, generally retain an average over the treatment unit of 10-15 tons of large down wood per acre. Emphasize retention of wood that is in the earliest stages of decay. Consider the effects of follow-up prescribed fire in achieving desired retention levels of down wood.

PROTECTION MEASURE: Do**not** Yard Un-merchantable Material (YUM) logs 20 inches diameter and 10 feet length, or larger, but leave the cull logs to meet the large down wood standard, where feasible. Retain snags for recruitment, where feasible and not a safety concern.

5.DESCRIPTION OF ALTERNATIVES

This chapter describes and compares the no action alternative, Alternative Aand two action alternatives, Alternative B (proposed action) andAlternative C (California spotted owl alternative).

5.1 Alternative A - No Action

While this alternative takes no action at this time, on-going activities such as routine road maintenance, fire suppression, and recreation may still occur in this area. This alternative serves as a baseline against which to compare the action alternative. Under Alternative A, no fuels treatments, forest health or restoration treatments would be implemented to accomplish the purpose and need. The intent and the desired condition set forth in the 1988 Plumas National Forest Land and Resource Management Plan (PNF LRMP) (USDA 1988), as amended by the Sierra Nevada Forest Plan Amendment (SNFPA) FSEIS and ROD (USDA 2004), would not be achieved. While no costs would be incurred with the "no" action alternative, hazard tree removal, no fuels reduction, or economic benefit would be extended to the rural communities as a result of this project.

5.2 Alternative B - Proposed Action

This alternative seeks 1) to protect, enhance and restore riparian, meadows, aspen areas and spotted owl and goshawk protected activity centers and territories; 2) remove hazard trees and reduce fuel ladders along roads, thereby increasing firefighter and transportation safety; 3) enhance forest health, increase tree vigor, reduce tree mortality and susceptibly to insect, disease and drought by reducing tree densities; 4) and provide some economic benefit utilizing sawlogs and biomass.

Proposed treatments would include a combination of variable density thinning, thinning from below, biomass removal, mastication, hand thinning, and prescribed fire. Alternative B is designed to the fullest extent possible incorporating the General Technical Report GTR-220 (North et al. 2009) and GTR-237 (North et al. 2012) and fulfills land management direction and the standards and guidelines for the 2004 SNFPA ROD land allocations (USDA 2004).The Forest Service would use specific treatment methods to achieve the desired results for the project. The following list briefly describes the treatment methods proposed:

Mechanical Thinning (timber removal): Removal of saw-timber sized trees (10 - 29.9 inches diameter breast height (DBH)) to thin the stand and remove ladder and canopy fuels. The goal is to increase ground-to-crown height, increase spacing between trees, and increase the spacing between tree crowns. Approximately 40 percent canopy cover would be retained on average over all treatment units, with a 30% canopy cover target near roads transitioning to 50% canopy approximately 200 feet from roads. The purpose of the 30% canopy cover standard near roads is to create safer conditions for firefighters to establish a fireline there. A fire will generally "lay down" to a ground fire when the flames cannot move from treetop to treetop.

Removal of conifers less than 30 inches DBH by individual tree selection using variable density thinning (VDT) in areas beyond the 200-feet road corridor buffer, aspen stands, meadow potential zones, and the Gibsonville town site resulting in 40 percent average canopy cover. Roadside thinning would be thinning from below to remove small and medium sized trees first and generally retaining the largest healthiest trees. VDT is a compilation of various thinning treatment elements: a) structural thinning and b) radial release of fire-resilient legacy trees.

Removal of conifers by individual tree selection within aspen stands including sawlogs 10 inches in diameter at breast height (DBH) and greater, as well as biomass conifers 3 inches to 9.9 inches DBH. Select ponderosa and Jeffrey pine trees greater than 30 inches DBH will be retained for wildlife purposes, structure, and species diversity as well as retention of exceptionally large conifers for aesthetic value. Species such as lodgepole pine and white fir will not be retained because of their vigor in encroaching meadows as well as the prolific seeding that is common for white fir.

The priority for thinning would be the removal of the smaller, suppressed, and intermediate-crown class trees (10-16 inches DBH), and removal of some co-dominant and dominant trees with crowns underneath and adjacent to healthy large trees. The preferred species for residual trees in this are shade-intolerant species where they exist. In order of preference, the shade-intolerant species are ponderosa pine, Jeffrey pine, black oak, sugar pine, Douglas-fir, incense-cedar, and true fir.

Mechanical thinning generally utilizes wheeled or tracked processing machines that cut, buck and limb trees onsite. Often, a separate machine carries or drags the logs to the landing area where they are stacked and stored for transport to a mill.

Hazard Tree Removal: Removal of trees deemed hazardous or dangerous based on Forest Services handbook standards for identifying such trees. This is generally done within two tree heights, or approximately 200 feet, from roads or structures.

Mastication: Removal of woody shrubs and trees using mechanical ground-based equipment to grind harvest residue or thin small trees. Shrubs and trees less than 10 inches DBH would be masticated, unless the trees are needed for the desired spacing. Most masticated trees would be less than 6 inches DBH.

Handcut andhandpile: Removal of shrubs and trees up to 10 inches DBH by manually cutting using chainsaws. These ground and ladder fuels are removed from beneath overstory trees, and/or aggregations of small-diameter conifers or plantation trees. The spacing of residual conifers and black oaks would be generally 18-24 feet to allow retention of the healthiest, largest, and tallest conifers and black oaks and to avoid creating openings where future regrowth would be likely.

Under burning and pile burning: The cut trees, shrubs, and existing slash would be manually piled and burned. Under burning is prescribed ground fire designed to reduce fuels on the ground.

Biomass Removal: Removal of surface and ladder fuels (trees 3.0 - 9.9 inches) following the guidelines stated above for mechanical thinning. Many ladder fuels fall into this size range. Biomass removal allows the option for these trees to be sold for small log uses rather than cut, piled and burned on site.

Sporax Treatment: To prevent the spread of Heterobasidion (occidentale or irregulare) root disease, the use of sodium tetraboratedecahydrate (a fungicide treatment) is proposed for use in areas with evidence of root rot. As a simple rule, Heterobasidionirregulare can kill ponderosa pine, Jeffrey pine, sugar pine, Coulter pine, incense-cedar, western juniper, and pinyon pine, while H. occidentale can kill true firs, hemlock, Douglas-fir, and giant sequoia. Sporax treatments would be applied to stumps of trees 14 inches in diameter and greater where they are within 200 feet of striking roads and other main travel routes. All stumps would be treated the same day or within 24 hours of cutting to maximize incorporation of the product into the stump while the stump is still moist. Sporax is typically applied at a rate of one pound per 50 square feet of stump surface. The application of Sporax will not be allowed within any riparian conservation areas (RCA) or streamside management zones (SMZs). Also see Gibsonville Project - Silviculture Report 2016, Appendix E, F and G, (USDA 2016c) for the number of acres that would be treated with sporax, the evaluation of human and ecological risk, and the herbicide/pesticide safety spill plan.

5.2 Alternative C – California Spotted Owl

This alternative was developed to analyze an alternative consistent with the *Draft Interim Recommendations for the Management of California Spotted Owl Habitat on National Forest System Lands 29 May 2015*. The recommended conservation measures provided in that document are based on the findings of the draft Conservation Assessment (USDA 2015), and represent a first approximation of actions available for consideration in the interim period between the development of the Conservation Assessment and implementation of a Conservation Strategy for the owl. These recommendations constitute a suite of measures that individually hold promise and support in scientific literature pertaining to owls and forest ecology, but they have not been field tested as a composite set of conservation measures. Thus, we cannot offer any certainty in terms of their benefits, only the potential for benefits based on the best available science in the form of the draft Conservation Assessment. Final interim recommendations may be issued once the draft Conservation Assessment is reviewed and finalized. The bulk of the work of reconciling the challenges that face the conservation of old forest ecosystems in the Sierra Nevada will fall to the Conservation Strategy.

Interim Recommendations (IR) for the California Spotted Owl (CSO) include a 300 acre Protected Activity Center (PAC), a 1,000 acre Territory (which includes the 300 acre PAC) and a 4,400 acre Home Range. This is similar to the current guidelines for the owl with the following changes:

- designation of a minimum canopy cover of 70% or greater for the 300 acre PAC habitat:
  - ✓ an increase over the 60-70% minimum.
- designation of a 1,000 acre Territory with a desired condition of a minimum of:
  - 400 acres of high quality nesting/roosting habitat, at 70% or greater canopy cover, ideally in the vicinity of the 300 ac PAC,
    - ✓ an increase of 100 acres over current guideline.
  - 600 acres of high quality habitat with a minimum of a 50% canopy cover,
    - ✓ currentguideline allows a 40% canopy cover based on limited exceptions.

Alternative C would have the same goals and objectives as listed in Alternative B above, but with a greater emphasis on retaining minimum habitat suitability with the CSO territories (previously known as Home Range Core Areas).Proposed treatments would be similar to Alternative B and would include a combination of variable density thinning, thinning from below, biomass removal, mastication, hand thinning, and prescribed fire. However, there would be a reduction of 116 acres of variable density thinning and more acres of hand cutting and piling and no treatment areas. Alternative C is designed to the fullest extent possible incorporating the General Technical Report GTR-220 (North et al. 2009) and GTR-237 (North et al. 2012) and fulfills land management direction and the standards and guidelines for the 2004 SNFPA ROD land allocations (USDA 2004).

6. SCOPE OF THE ANALYSIS

The scope of analysis in determining the environmental consequences (i.e., direct, indirect, and cumulative effects) for each of the alternatives can also be narrowed down in scope to a geographic boundary (i.e., a Forest, a Ranger District, a management area, a timber compartment, a watershed, a sub-watershed, project area, etc.) and a temporal (i.e., 1 year, 10 years, 100 years, etc.) boundary. Each resource area (i.e., aquatics, botanical, hydrological, timber, wildlife, etc.) may have different geographical and temporal boundaries.

6.1 Geographic Boundary

The GibsonvilleProject is situated northeast of the town of LaPorte, California. The analysis area is comprised of areas, which maintain and encompass the species habitats. The terrestrial and aquatic wildlife analysis area (refer to **Figure 2**) used for determining direct, indirect and cumulative effects to theCalifornia spotted owl, Northern goshawk, Pacific marten, Pallid bat,Townsend's big-eared bat, Fringed myotis, and Western bumble beetotals **5,330**acres. These acres include **3,952** acres of National Forest System land and 1,378 acres of private land. Elevations within the project boundary range from 4,900 to 6,400 feet. Refer to **Table 4** for the number of FS to private acres within the wildlife analysis area.

The direct and indirect effects analysis area for wildlife species analyzed was the **1,200** acres proposed for treatment under the Gibsonville Project.These effects are caused by the action and occur at the same time, or later in time or further removed in distance.

Table 4. Acres of Forest Service and Private within the wildlife analysis area.

Subwatershed	ACRES		
	Private	Forest Service	Total
Whiskey Creek (1)	65	950	1,016
Union Keystone (2)	123	931	1,053
Gibson Creek (3)	347	842	1,189
Wallace Creek (4)	827	485	1,312
Slate Creek (5)	16	744	760
	1,378	**3,952**	**5,330**

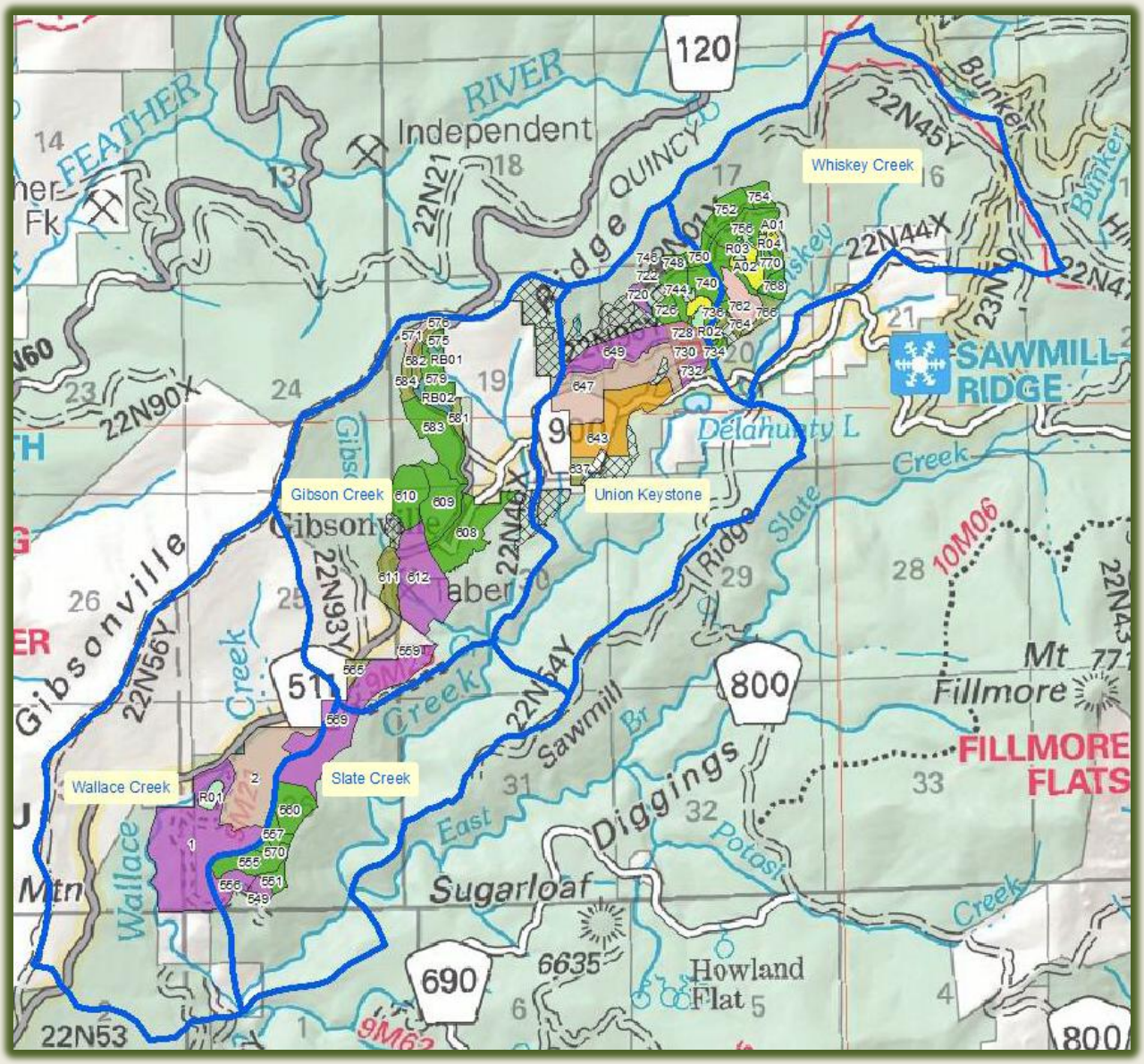

Figure 2. Gibsonville Project - wildlife analysis area (blue outline of 5 subwatersheds).Includes Alternative B units.

The cumulative effects analysis area, **5,330** acres, for terrestrial and aquatic wildlife species analyzed was chosen based on the project treatment locations, the amount, location and intensity of treatments, survey requirements and the natural topography. If the analysis area is too large, relative to the proposed action size and intensity, the effects can be diluted and thereby not meaningful. Relative to the broad ranging species discussed in this document, their breeding, nesting, foraging and home ranges can vary in extent depending on the species. The cumulative effects analysis area includes past, present, and reasonably foreseeable future projects occurring within the Gibsonville Project wildlife analysis area. Past actions that occurred in and around the proposed Gibsonville Project treatments, such as timber sales and fuel reduction projects on Forest Service and on private lands were included. Limitations of the analysis include future activities on private land. Past activities are considered part of the existing condition and are discussed in the "Existing Condition" section for each resource.

6.2 Time Frame

The time frame for determining cumulative effects depends on the length of time past effects continue on into the future. This will vary widely between species because some wildlife, such as the California spotted owl, require large territories (home range areas) with mature, multi-canopy forests and diverse habitat components such as snags and large woody material while others species such as the Townsend's big-eared bat, require smaller home range areas and simpler habitats such as mine shafts/bridges/buildings with riparian foraging habitat. Consequently, the analysis timeframe will vary for each species and will be dependent in part on past actions where species are located or there is suitable habitat. Generally, from the broadest perspective the timeframe for past cumulative effects on the wildlife analysis area is ca. 20 years.

7. ANALYSIS METHODS

Several methods provide the basis for understanding the nature and extent of wildlife resources within the analysis area, and the potential effects of proposed fuels reduction and vegetative treatments on this resource. Archival and literature sources have been reviewed and data from Forest Service wildlife resource records, maps and geographic information system (GIS) layers compiled to provide a historic overview of species status at a bio-regional geographic region, identify major localized use and natural disturbance events, and to provide information on previous field survey inventories, and to determine data confidence or accuracy.

7.1 Data Sources

Several types of data provided the basis for understanding the nature and extent of the potential effects of the proposed action.

- Archival and literature sources including prior terrestrial and aquatic species surveys, vegetation typing and stream mapping data from Forest Service resource records.
- GIS layers to build Habitat Suitability Models: species detections; vegetation; elevation contours; stream classification, slope and gradient; riparian or meadow vegetation, lake or ponds, and species detections.
- Site-specific target species surveys conducted in project area using FS approved protocols.
- Resource expert field reconnaissance and observations conducted in 2012 through 2016.

7.2 Protocols

Most recent site-specific wildlife surveys were conducted in2013 through 2016 using Region 5 Protocols, as available. Resource expert field reconnaissance and observations were also conducted.

California Spotted Owl: Surveys follow the "Protocol For Surveying For Spotted Owls In Proposed Management Activity Areas And Habitat Conservation Areas"; U.S. Forest Service-Region 5; March 12, 1991 (revised February 1993)(USFS 1993).

Northern Goshawk: Surveys follow the "Survey Methodology for Northern Goshawks in the Pacific Southwest Region", U.S. Forest Service, May 14, 2002 (USFS 2002).

Pacific Marten: Surveys follow the "Pacific Marten, Fisher, Lynx, and Wolverine: Survey Methods for their Detection"; U.S. Forest Service-Region 5, Zielinski/Kucera; PSW-GTR-157; August 1995 (Zielinski et al 1995).

Pallid Bat, Townsend's big-eared Bat and Fringed Myotis: There is no formal protocol adopted by Region 5 for bat surveys. Surveys are conducted by biologists certified to conduct bat surveys. All survey plans are approved prior to implementation.

Western Bumble Bee: There is no formal protocol adopted by Region 5 for bumble bee surveys. Surveys are conducted by experienced biologists. All survey plans are approved prior to implementation.

Great Gray Owl: Surveys follow "Survey Protocol for the Great Gray Owl in the sierra Nevada of California"; Prepared Thomas W. Beck and Jon Winter for the USDA Forest Service Pacific Southwest Region, Vallejo, May 2000 (USDA 2000).

7.3Geographic Information System

A Geographic Information System (GIS) was used to analyze forest vegetation on the landscape scale for the analysis area. Forest-wide vegetation typing into California Wildlife Habitat Relationships (CWHR) classifications (Mayer and Laudenslayer 1988) was done for the Plumas-Lassen Administrative Study in 2002 (VESTRA Resources, Inc. 2002). The Herger-Feinstein Quincy Library Group (HFQLG) 2005 Vegetation Mapping Project mapped areas on the Plumas National Forest not covered by VESTRA. These data were combined in a GIS to provide a complete map of the existing vegetation within the analysis area. Then this information was updated and a new existing vegetation layer for Region 5 was created and then used in this analysis. All vegetation information is displayed using CWHR vegetation typing and serves as the baseline acres for analysis. The distribution of CWHR size class and density was analyzed relative to the stand-level effects modeled by CWHR size class.

7.4 California Wildlife Habitat Relationship (CWHR)

California Wildlife Habitat Relationship (CWHR)(Zeiner et al 1988, 1990a and 1990b) classifies existing vegetation types important to wildlife. This system was developed to recognize and logically categorize major vegetative complexes at a scale sufficient to predict wildlife habitat relationships. The CWHR system has three elements: (1) major tree-dominated vegetation associations, (2) tree size, and (3) canopy cover. Refer to **Table 5**.

The relative distribution of seral stages within the landscape is measured by using CWHR size class as a proxy for seral stage. **Table 5** displays the CWHR tree size and density class categories. CWHR size class serves as an effective proxy for seral stage because it classifies forest vegetation by ranges of average tree

size which represent discrete developmental stages of tree growth. CWHR density class serves an effective proxy for open and closed-canopy conditions because it classifies canopy cover. In addition, this allows for a congruent analysis of effects on forest vegetation and wildlife habitat. Forest stands were aggregated by CWHR size class because the proposed treatments, stand structure, and effects of treatments on stand structure would not substantially vary by forest vegetation type (as classified by CWHR habitat type).

Table 5. CWHR* tree size and density class crosswalk with seral stage and canopy closure condition.

CWHR Tree Size Categories				CWHR Density Class Categories			
CWHR Size Class	**Tree Sizes (average)**	**Description**	**Seral Stage**	**CWHR Density Class**	**Tree Canopy cover**	**Description**	**Canopy Conditions**
1	< 1" DBH	Seedlings, but definite forest habitat	Early Seral	n/a	< 10%		Open canopy Stands
2	1 -6 " DBH	Sapling		S	10 - 24%	Sparse	
3	6 - 11"DBH	Pole-sized tree		P	25 - 39%	Open	
4	11–24" DBH	Small Tree	Mid-seral	M	40 - 60%	Moderate	Closed-canopy Stands
5	> 24" DBH	Medium/Large tree	Later Seral	D	> 60%	Dense	
6	> 24" DBH	Multilayered canopy with dense cover		n/a	> 60%		

7.5Common Stand Exams

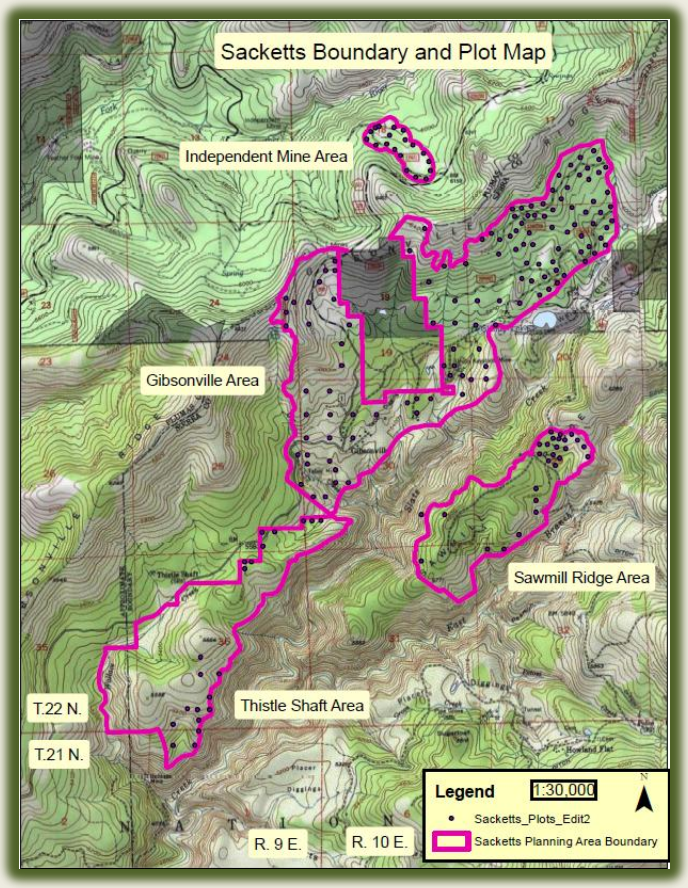

Figure 3: Common Stand Exams(Sacketts=Gibsonville)

Stands within the proposed Sacketts project area were inventoried in the summer of 2013 using the current Common Stand Exam User's Guide for the Pacific Southwest Region 2008. See **Figure 3**. The Sacketts project was later renamed Gibsonville, and the Independence and Sawmill Ridge areas were dropped. The Common Stand Exam system is used to collect data from a series of random points located within a number of stands with a possible need for treatment. Each sample point consists of nested plots: (1) A variable radius prism (30 BAF) plot to gather data on **large** (greater than 4.9 inches DBH) **live trees**. (2) A 1/100 acre fixed radius plot for live **saplings and seedlings**.(3) A variable radius prism (10 BAF) plot for **large snags** (greater than 14.9 inches DBH and greater than 19.9 feet tall). (4) A 80-foot transect for collecting **down woody material and down logs**.

7.6Indicators and Measures

Indicators include habitat components that typify the typical requirements for a species to thrive and sustain populations (e.g. canopy cover, tree size, and snags). Habitat requirements are defined as those providing nesting habitat and foraging opportunities with an adequate prey base that help maintain populations over-time. Habitat requirements vary widely by species, there are indicators of habitat structures and components that when altered can have a measurable effect on species. Refer to **Table 6** for the indicators and the associated measures used to evaluate effects to species for the proposed project.

Table 6. Wildlife Habitat Guide with Associated Species by Indicators and Measures.

SPECIES	INDICATORS	MEASURES
Wildlife Habitat (applies to all species)	Large Trees	Number of 30" dbh and greater
	Snags	Number of 15" dbh and greater
	Large Down Wood	10-15 tons per acre 10' length and 20" diameter
	Hardwoods	Retain all hardwoods≥ 12 inch dbh
	Road Density	Desired condition of < 2 miles per square mile.
California Spotted Owl	***Nesting habitat*** CWHR 5M and 5D large trees moderate-dense canopy	acres
	Foraging habitat CWHR 4M and 4D medium-large trees moderate-dense canopy	acres
Northern Goshawk	***Nesting habitat*** CWHR 4M, 4D, 5M and 5D medium-large trees moderate-dense canopy	acres
	Foraging habitat CWHR 3M, 3P, 4P and 5P small-medium trees moderate-dense canopy	acres
Pacific Marten	***Denning habitat*** CWHR 4D and 5D medium-large trees dense canopy	acres
	Foraging habitat CWHR 4M and 5M medium-large trees moderate canopy	acres
Pallid Bat **Townsend's Big-eared Bat** **Fringed Myotis** **Western Bumble Bee**	medium to large trees 20"dbh and greater	number
	Riparian Conservation Areas (streams, meadow, riparian, ponds, aspen) Improved Reduced	 acres acres

7.7 Assumptions

The following are assumptions related to the proposed action:

- ***Assumption 1*:** The 2004 SNFPA FSEIS&ROD provides an analysis for wildlife and aquatic species. This document tiers to the SNFPA analysis and species determinations.
- ***Assumption 2*:** Analysis assumes occupancy unless project area has been surveyed to protocol and found to be absent of the species.
- ***Assumption 3*:** All project specific design featuressuch as standards and guidelines, standard operating procedures (SOPs) and mitigations would be fully adhered to and implemented, including the use of the appropriate Limited Operating Periods (LOPs).
- ***Assumption 4*:**Most activities proposed would be completed within five years.
- ***Assumption 5*:**All wildlife trees (nest trees, roosts, etc.) that are known inhabited would be retained unless they pose a safety hazard.
- ***Assumption 6*:**Proposed activities have the potential to affect Threatened, Endangered, Proposed or Forest Service Sensitive species, directly by the modification of habitat or by loss of habitat, but rarely from direct mortality (if nest tree is felled), or indirectly through habitat modification (e.g., changes to canopy cover, age class structure and species composition).
- ***Assumption 7*:**Treatments such prescribe burns, hand-cut pile then burn, or grapple pile and mastication have low impact on habitat suitability for wildlife, than would mechanical thinning or group selections.
- ***Assumption 8*:** Retaining the integrity of the 300-acre PACs for California spotted owls and 200-acre PACs for goshawks is adequate to maintaining current populations.
- ***Assumption 9*:** California spotted owls would have adequate foraging areas around their PAC based on preliminary findings; California spotted owls forage much closer to their site center (within the PAC) than expected by chance (Plumas-Lassen Administrative Study 2010 California Spotted Owl Annual Report).
- ***Assumption 10*:**Fragmentation at this scale would not obstruct a species movement across the landscape or reduce current populations due to separation.
- ***Assumption 11*:**Aquatic habitats and associated stream systems can tolerate certain levels of land disturbance. However, widespread or intense land disturbances applied in sensitive areas such as RCAs can substantially impact the immediate area or downstream channel stability and water quality.

8. AFFECTED ENVIRONMENT and ENVIRONMENTAL EFFECTS

8.1 Introduction

The stated primary purpose and need (P&N) for the project is fuels reduction: to reduce the surface and ladder fuels by thinning, handcut/handpile/burn (HCPB), mastication and/or underburn. Refer to the GibsonvilleProject – Fire&Fuels Report 2016(USDA 2016d). Another P&N is forest health which addresses the loss of trees from root disease by thinning out trees, primarily fir, under 24” dbh and removal of dense fir pockets and to promote growth of pine trees which are underrepresented. Refer to the Gibsonville Project - Silviculture Report 2016 (USDA2016c). There is also a P&N for restoration for watershed health which includes restoring hydrologic connectivity, aspen, aquatic and riparian habitat, and spotted owl and marten habitat.

***Direct Effects*:** include immediate changes in habitat conditions and disturbance or harassment of individual animals, including direct mortality, during project activities.

***Indirect Effects*:** include changes that occur later in time, such as long-term changes in habitat structure, or changes in human uses within the project area. Indirect effects can also include effects to a species' prey base.

***Cumulative Effects*:** "The impact on the environment which results from the incremental impact of the action when added to other past, present, and foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively substantial actions taking place over a period of time" (40 CFR 1508.6).

For the affected species, effects are discussed in terms of the prescriptions proposed for each treatment type. Prescriptions for treatments are broken down into two groups for this effects analysis: 1) Mechanical which includes variable density thinning, roadside hazard tree, mastication, aspen release and biomass; and 2) Non-mechanical which includesHCPB, underburning, riparian and meadow restoration (HCPB).

There is a description of the existing condition for each indicator, followed by a summary of the direct, indirect, and cumulative effects of the alternatives. Direct effects are likely to be limited to the project implementation phase. Indirect effects would last beyond the implementation period and occur within the temporal bound of the cumulative effects analysis. In order to understand the contribution of past actions to the cumulative effects of the proposed action and alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects. This cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis, but relies on current environmental conditions as a proxy for the impacts of past actions.

8.2Terrestrial Habitat

AffectedEnvironment

The elevation in the project area ranges from 5,200 feet near Wallace and Slate Creeks to 6,400 feet near Gibsonville Ridge. Elevation affects the forest types that are present. The forest types in the analysis area range from ponderosa pine and Sierra mixed conifers at lower elevations to true fir (white and red fir) at higher elevations. Refer to **Table 7**.

Table 7. Description of forest types found in the project area.

Forest Type	Major Species	Other Species Present
Ponderosa pine	Ponderosa pine (*Pinus ponderosa*)	Incense-cedar (*Calocedrus decurrens*) Douglas-fir (*Pseudotsuga menziesii)* Sugar pine (*Pinus lambertiana*)
Sierran mixed conifer	Jeffrey pine (*Pinus jeffreyi*), Sugar pine, Incense-cedar *and* White fir (*Abies concolor*)	Douglas-fir Black oak (*Quercus kelloggi*)
True fir	White fir (*Abies concolor*) Red fir (*Abies magnifica*)	Incense-cedar, Douglas-fir, sugar pine, and Black oak

On a landscape scale, **Table 8** shows existing CWHR vegetation types, size class distribution, and canopy cover distribution for the sub-watersheds within the project area and **Table 9** shows the landscape

structure within each sub-watershed.Over65 percent of the acres in the analysis area are in the moderate to dense canopy cover classes, which indicates multiple canopy layers and interlocking crowns. In addition, over 68 percent of the analysis area is in the poles to small tree size classes, which indicate an increased fire hazard risk potential.Refer to the Gibsonville Project - Silviculture Report 2016, Tables 11 and 13,for further break outs (USDA 2016c).

The existing conditions show thatcrown base heightsare higher than the fire behavior desired conditions, it should be noted that the FVS modeling results were averaged throughout the different prescribed treatment stands, some stand exhibited differing canopy base heights than the averaged results. However, fire suppression, lack of disturbance, and past practices has created a dense multilayered understory also known as ladder fuels. Heavy dead and down fuel loading and ladder fuels result in high flame lengths. Refer to vegetation discussion above. Refer to the Gibsonville Project – Fire & Fuels Report 2016 for a discussion regarding hazardous fuels (USDA 2016d).

Table 8. Summary of vegetation type, size class and canopy closure distribution within Gibsonville analysis area.

CWHR	Forest Vegetation Data	Total Sub-Watershed Acres	Percent of Total Acres
Vegetation type diversity	Barren (includes water and wet meadow)	123	3.1%
	Shrub Types (montane chaparral)	514	13.0%
	Oak woodland, foothill pine	0	0%
	Montane hardwoods	0	0%
	Sierra mixed conifer	1,629	41.2%
	True fir (White and Red)	1,683	42.6%
	Pine (ponderosa, Jeffrey)	3	0.1%
	TOTALS	**3,952**	**100%**
Size Class Distribution	Miscellaneous (barren, water, grassland, shrubs)	631	16.0%
	1) Seedling (less than 1 inch DBH)	0	0%
	2) Sapling (1–6 inches DBH)	9	0.2%
	3) Pole (6–11 inches DBH)	565	14.3%
	4) Small Tree (11–24 inches DBH)	2,094	53.0%
	5) Medium/Large Tree (> 24 inches DBH)	653	16.5%
	6) Multi Layered (Size 5 over 4 or 3; Canopy >60%)	0	0%
	TOTALS	**3,952**	**100%**
Canopy Closure Distribution	NA (0–9%) (barren, water, grassland, shrubs)	631	16.0%
	S) Sparse (10–24%)	162	4.1%
	P) Open (25–39%)	588	14.9%
	M) Moderate (40–59%)	895	22.7%
	D) Dense (60–100%)	1,676	42.4%
	TOTALS	**3,952**	**100%**

Notes: Sub-watershed acres include only FS land.

Table 9. Existing acres of CWHR size and density classes within the Gibsonville analysis area (FS lands)

CWHR Size and Density Class	Acres by sub-watershed					
	Gibson Creek	Slate Creek	Union Keystone	Wallace Creek	Whiskey Creek	**Total**
X	85	319	146	8	73	**631**
2D			3		2	**5**
2P					0	**0**
2S					4	**4**
3D	3	70		84		**157**
3M	22		14	6	4	**46**
3P	20	2	111	12	72	**217**
3S	10	7	46		82	**145**
4D	**192**	**117**	**459**	**118**	**210**	**1,095**
4M	**118**	**82**	**15**	**111**	**376**	**702**
4P	133	14	46	5	86	**284**
4S		3		3	7	**13**
5D	**261**	**49**	**38**	**71**		**419**
5M	**0**	**52**	**28**	**67**		**148**
5P		28	24		35	**87**
Total	**842**	**744**	**931**	**485**	**950**	**3,952**

Environmental Effects

Landscape structurerefers to the distribution of relative successional (seral) stages on the landscape, and the relative distribution of closed-canopy and open-canopy stands. This is an important indicator because it may be used as a measure of landscape heterogeneity and diversity, and as a measure of cumulative effects to forest vegetation on the landscape scale. Landscape structure is measured by calculating the distribution of these seral stages within the vegetation analysis area. The relative distribution of seral stages within the landscape is measured by using CWHR size and density class as a proxy for seral stage.

Table 10 displays a summary comparison of the differences in acres treated between the no action alternative, Alternative A, and the action alternatives, Alternatives B and C. **Tables 11, 12 and 13** display the comparison of differences in the acres of CWHR size class and density values (canopy cover) based on the no action alternative, Alternative A, and the two action alternatives, Alternatives B and C, at the project level scale (1,200 acres). Refer to Gibsonville Project - Silviculture Report 2016, Tables 18, 19 and 21 for a finer breakout of treatments (USDA 2016c).

Table 10. Summary comparison of treatment acres by action alternatives.

	Acres		
Proposed Treatment	**Alternative B**	**Alternative C**	**Difference**
Variable Density Thin-40% canopy cover, Underburn&Biomass	**359**	**243**	**-116**
Aspen Release and Biomass	**23**	**23**	**0**
Hand cut pile burn and Underburn	**345**	**435**	**+91**
Masticate and Underburn	18	18	0
Masticate and Underburn and Biomass	26	26	0
Masticate or Hand cut pile burn or Underburn	137	137	0
Meadow Restoration and Biomass	9	9	0
Riparian Restoration	16	16	0
Roadside Hazard and Hand cut pile burn	54	54	0
Roadside Hazard and Hand cut pile burn and Biomass	61	61	0
Underburn	7	7	0
No Treatment	**146**	**171**	**+25**
Total	**1,200**	**1,200**	

The action alternatives would increase the likelihood that wildland fires occurring in the treatment units could be successfully suppressed by initial attack resources compared to the no action alternative. The action alternatives would also provide a safer location for fire suppression resource to indirectly attack a wildfire. This would occur because of 4 factors: (1) opening overstory canopy; (2) reducing ladder fuels; (3) reducing surface fuels, and; (4) strategic location of treatments. Refer to the Gibsonville – Silviculture Report 2016 for discussion regarding forest health and disease.

Refer to **Table 11**for a list of acres of perennial and intermittent, and ephemeral streams within the 82 ft SNYLF suitable habitat buffer. These acres are included in the total acres displayed in **Tables 12-14**. All proposed treatments follow all the USFS Design Features for additional species protection. Mechanical activities are not proposed within a 150 ft of perennial streams (which includes the 82 ft SNYLF suitable habitat buffer) with the exception of the aspen treatments. Non-mechanical beneficial activities are proposed within the 150 ft buffer for perennial streams and 82 feet of intermittent. Refer to **Figure 4** below which shows the 82 ft buffer for perennial and intermittent, and ephemeral streams. Refer to Gibsonville Project - Aquatic BEBA 2016, Environmental Effects discussion and analysis (USDA 2016b).

Table 11. Acres within 82 ft of Perennial, Intermittent and Ephemeral stream buffers.

TREATMENT TYPES	ACRES					
	Perennial		Intermittent		Ephemeral	
	Alt B	Alt C	Alt B	Alt C	Alt B	Alt C
Mechanical – no treatment in 82ft buffer						
VDT 40% and UB and BIOMASS	17.6	16.8	44.3	41.1	45.9	33.0
Aspen Release and BIOMASS	6.0	6.0	3.5	3.5	7.2	7.2
MAST and UB	2.2	2.2	7.0	7.0	1.2	1.2
MAST and UB and BIOMASS	0.0	0.0	0.0	0.0	2.3	2.3
MAST or HCPB or UB	4.2	4.2	10.4	10.4	27.2	27.2
Roadside Hazard and HCPB	0.0	0.0	11.5	11.5	11.4	11.4
Roadside Hazard and HCPB and BIOMASS	8.0	8.0	2.8	2.8	11.6	11.6
subtotal	**38.0**	**37.2**	**79.5**	**76.3**	**106.8**	**93.9**
Non-Mechanical – treatments within 82 ft buffer						
Riparian Restoration	2.1	2.1	4.9	4.9	2.4	2.4
Meadow Restoration and BIOMASS	0.4	0.4	4.5	4.5	2.3	2.3
HCPB and UB	21.8	21.8	30.1	33.2	66.0	73.9
UB	0.0	0.0	0.0	0.0	2.7	2.7
NT	9.8	10.6	5.1	5.2	17.7	22.6
subtotal	**34.1**	**34.9**	**44.6**	**47.8**	**91.1**	**103.9**
Totals	**72.1**	**72.1**	**124.1**	**124.1**	**197.9**	**197.8**

Table 12.Alternative A: Pre-treatment landscape structure (CWHR size and density classes) acres by treatments.

Pre-Treatment	Acres by CWHR														
	X	2D	2S	3D	3M	3P	3S	4D	4M	4P	4S	5D	5M	5P	Total
VDT 40% and UB and Biomass				46	1	1	1	147	5	12		147			**359**
Aspen Release and Biomass							1+	21							**23**
HCPB and UB	1			39	3	13		145	106	7		29	1		**345**
NT	11				4	6	5	105	10	6					**146**
Roadside Hazard and HCPB (? Biomass)						2		70	16			25			**115**
MASTICATION & UB or HCPB or Biomass				8		7		140	13	13					**181**
Meadow Restoration and Biomass	2				6										**9**
Riparian Restoration	4	3					5	5							**16**
UB	1							3		3					**7**
Total Acres	**20**	**3**		**93**	**15**	**27**	**12**	**637**	**151**	**41**	**0**	**202**	**1**		**1,200**

Table 13.Alternative B: Post-treatment landscape structure (CWHR size and density classes) acres by treatments.

Proposed Treatment	Acres by CWHR														
	X	2D	2S	3D	3M	3P	3S	4D	4M	4P	4S	5D	5M	5P	Total
VDT 40% and UB and Biomass				46	1	1	1		152	12			147		**359**
Aspen Release and Biomass							1+				21				**23**
HCPB and UB	1				39	16		145	106	7		29	1		**345**
NT	11				4	6	5	105	10	6					**146**
Roadside Hazard and HCPB (?biomass)						2		70	16			25			**115**
MASTICATION & UB or HCPB or Biomass						15		140	13	13					**181**
Meadow Restoration and Biomass	2					6									**9**
Riparian Restoration	4	3					5	5							**16**
UB	1							3		3					**7**
Total Acres	**20**	**3**	**0**	**46**	**44**	**45**	**12**	**398**	**282**	**127**	**22**	**29**	**147**	**25**	**1,200**
Acre differences from Alternative A	0	0	0	-47	29	18	0	-239	131	86	21	-172	147	25	0

Table 14.Alternative C: Post-treatment landscape structure (CWHR size and density classes) acres by treatments.

Proposed Treatment	Acres by CWHR														
	X	2D	2S	3D	3M	3P	3S	4D	4M	4P	4S	5D	5M	5P	Total
VDT 40% and UB and Biomass					1		1		110	12			119		**243**
Aspen Release and Biomass							1+				21				**23**
HCPB and UB	2				85	16		160	108	7		56	1		**435**
NT	11				4	6	5	130	10	6					**171**
Roadside Hazard and HCPB (?biomass)						2		70	16			25			**115**
MASTICATION &UB or HCPB &/or Biomass						15		140	13	13					**181**
Meadow Restoration and Biomass	2					6									**9**
Riparian Restoration	4	3					5	5							**16**
UB	1							3		3					**7**
Total Acres	**20**	**3**	**0**	**0**	**90**	**45**	**12**	**438**	**241**	**127**	**22**	**57**	**120**	**25**	**1,200**
Acre differences from Alternative A	0	0	0	-93	75	18	0	-198	91	86	21	-145	119	25	0
Acre differences from Alternative B	0	0	0	-46	46	0	0	40	-40	0	0	28	-28	0	0

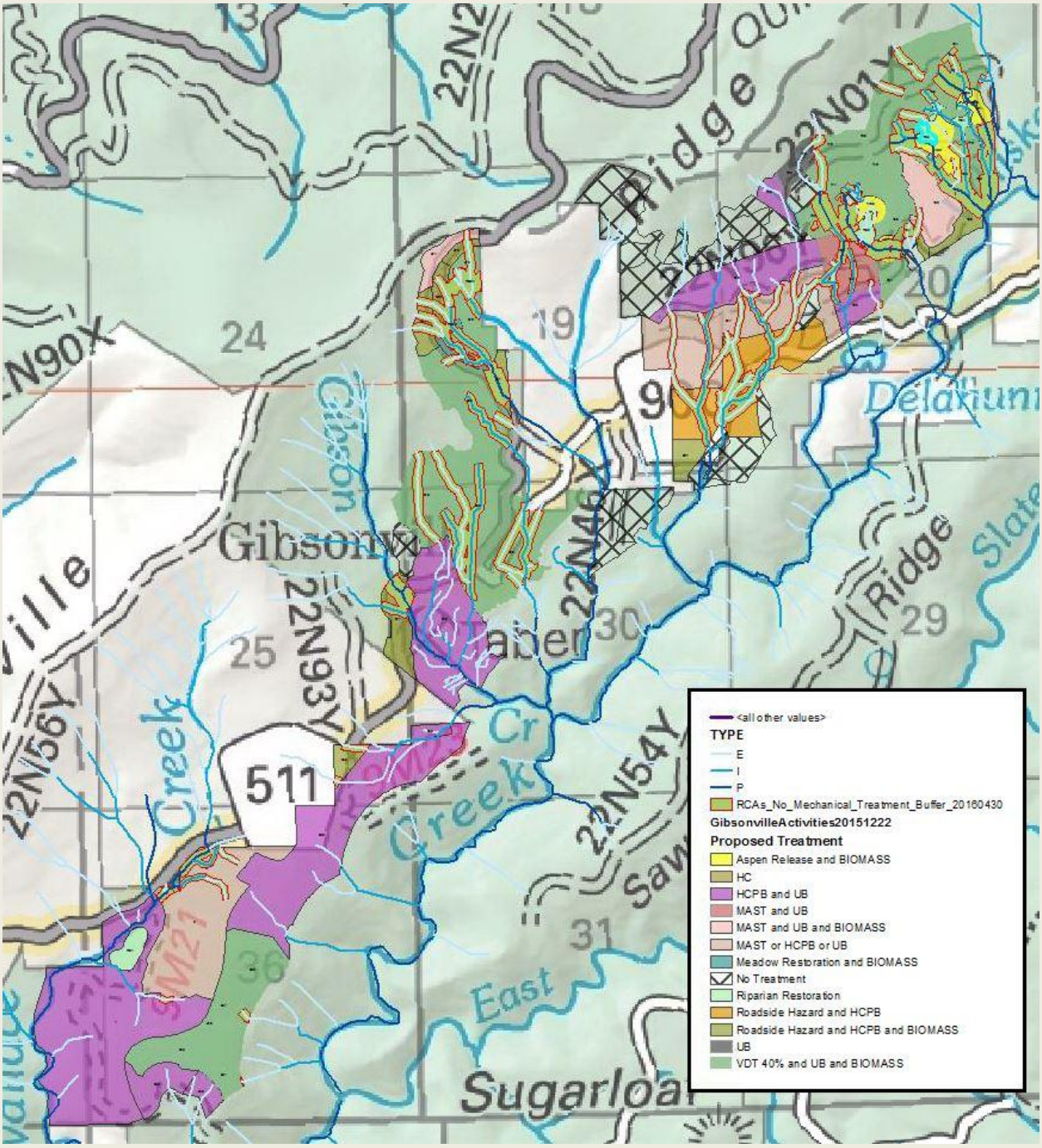

Figure 4. Figure shows the 150 ft EEZ for perennial and 82 ft EEZ for intermittent and ephemeral streams.

Alternatives B and C would allow for fuels reduction such as VDT along high use roads and mastication, HCPB, aspen/meadow/riparian restoration and/or underburning which would reduce the fuel loading and increase the water flow into creeks. However, under Alternative A, areas within the RCAs will be will not

be treated which could decrease the opportunities for opening up over crowded areas with dense surface and ladder fuels, thereby leaving existing fuel-loadings which could lead to high intensity and severity wildfires, and not increasing water availability to creeks. This would be an adverse effect to frogs and their habitat. Habitat improvement activities such as removing encroaching conifers from meadows and aspen stands which could be lost due to conifer conversion, or reducing surface and ladder fuels which could lead to habitat loss due to high intensity and severity wildfires. These activities would benefit habitat in the short- and long-term for frogs.

Based on forest vegetation typing the majority of the existing vegetation is at a size class 4 (12-24" dbh tree)with less in the size class 5 (24" dbh or greater). The canopy cover averages between a medium (M=40-60%) and dense (D=60-100%). Most of the D stands are closer to the low 60% canopy cover, however, there were a few in the low 70% canopy cover. Common stand exams covering the proposed treatment units show that the existing canopy cover is already low for mature/old forest dependent species. The average canopy cover for all of the units is 52% and for just the VDT 40% units it is 55.7%.

Wildlife species such as the Pacific marten, Northern goshawk and the California spotted owl are positively associated with occupancy in contiguous patches of dense, mature/late seral forest and therefore maintaining or improving this habitat type should be a high priority. Although fuels reduction, if applied properly, may protect remaining fragments of mature/late-seral habitat from loss due to fire, these treatments can also result in a reduction of canopy cover and layers; potentially increasing fragmentation of existing suitable habitat and increasing surface growth of dense brush or small trees.

No Action: Alternative A

DIRECT and INDIRECT EFFECTS: Under Alternative A, the no action alternative, existing stand conditions would persist and develop unaltered by active management, with the exception of continued fire suppression activities. Wildfire, drought, disease, and insect-related mortality and recruitment would continue to occur. Alternative A would not restore aspen, meadows, or riparian area nor reduce hazardous fuel accumulations to improve forest health or public safety. The existing forest and landscape structure could lead to a greater potential for large, moderate to high-severity fires in forested areas, including the wildland urban interface, riparian conservation areas, protected activity centers, and home range core areas in the analysis area during a wildfire under severe weather conditions.

Action Alternatives: Alternatives B and C

DIRECT and INDIRECT EFFECTS: The majority of the CWHR changes would occurred in the 4D/M, 5D/M size and density classes under the VDT 40%and Aspen area treatments. For all VDT units the adjusted RCAs for perennial streams is 150 ft and intermittent/ephemeral streams an 82 ft EEZ. Within the 150ft and 82ft zones there is no mechanical treatment allowed except for the option to HCPB and/or underburn.

Variable Density Thin: Mechanical treatments under Alternative B and to a lesser degree Alternative C, would reduce stand density through thinning and removal of conifers up to 29.9 inches DBH. The Gibsonville project incorporates the concepts of GTR-220, which allows intermediate to larger diameter trees (up to 29.9 inches DBH) to be harvested (i.e., overtopping black oaks or aspen, reducing tree density and promoting crown separation near roads and upper slopes). Trees per acre would be reduced by variable density thinning, removing sapling and pole size trees and some co-dominant trees, creating 1/10 acre to ½ acre gaps, and skipping other areas by leaving moderate to high density areas.

Alternative B would have a greater effect on stand and landscape structure (i.e., canopy cover and trees per acre by DBH size classes) and Alternative C would have similar affects but fewer acres treated. The

majority of the CWHR changes would occurred in the 4D/M, 5D/M size and density classes under the VDT 40% treatments.

> ***Under Alternative B, 359 acres would be reduced to 40% canopy cover. However, of the 359 acres approximately 108acres within RCAs only have the option for HCPB and/or underburn.Under Alternative C, 243 acres would be reduced to 40% canopy cover. However, of the 243 acres approximately 108acreswithin RHCAs only have the option for HCPB (refer to Tables10 and 11).

Therefore the canopy cover for the 108 acres of RCA would not change.Inaddition the remaining 251 acres of VDT 40% would be expected to recover low-mid story canopy within 10-20 years based on high growing conditions of the area. Under Alternative C, 116 acres (9.7 percent of the treatment acres) of proposed Variable Density Thin under Alternative B would change to 91 acres of HCPB and 25 acres to notreatment**.**Pre-commercial thinning (less than 10" DBH) would not reduce overall basal area and trees per acre when compared to commercial thinning (greater than 10" DBH). However, pre-commercial thinning up to 10"dbh would reduce the surface fuels. Commercial thinning would reduce the overall canopy cover and layering affect.

In general, forested stands proposed for thinning treatments by VDT 40% within the project area are primarily CWHR 4D/M and CWHR 5D/M stands. **Table 15** displays the before (Alternative A) after (Alternatives B&C) thinning results for of the stand structure (trees per acre and canopy cover by DBH classes) of the various CWHR 4D/M, and 5D/5M size and density classes. **Table 15** shows that the larger number of trees are in the 1-11 inch dbh trees which contribute to surface and ladder fuels while the 11->30 inch dbh trees make up the canopy cover and layering. As presented in **Table 15**theaverage percent canopy cover can change by a total of 20% by removing surface and ladder fuels: 12-14 percent by simply removing the saplings (0-6" DBH) another 6-7 percent by simple removing pole size trees (6-10 dbh). Refer to Gibsonville Project - Silviculture Report 2016, Tables 9, 16 and 17 for a finer breakout of treatments (USDA 2016c).**Table 16**displays the stand attributes by CWHR size and density classes for the no action and action alternatives. **Table 16** shows that stands would remain dense with no treatment, particularly in the smaller diameter (1-11") classes in terms of trees per acre, basal area and stand density index. Refer to Gibsonville Project - Silviculture Report 2016, Tables 4, 5, 6 and 9 for a comparison of trees per acre, basal area and stand density index for Alternatives A, B and C (USDA 2016c).

Table 15. Existing (Alternative A) and post-treatment (Alternatives B&C) stand structure for CWHR 4D/M and 5D/M stands by number of trees per acre and percent canopy cover.

CWHR		Trees per acre stand structure by DBH size classes					
		1-6"	6-11"	11-24"	24-30"	>30"	Total
Alt	4D/M	630	41	50	15	24	760
Aexisting	5D/M	470	44	68	18	19	620
Alt B&C	4D/M	28	12	19	8	24	91
40% avg	5D/M	7	9	25	13	19	74
CWHR		**Canopy Cover stand structure by DBH size classes**					
		1-6"	6-11"	11-24"	24-30"	>30"	Total
Alt	4D/M	14	9	19	11	26	52
Aexisting	5D/M	14	9	25	13	22	55
Alt B&C	4D/M	2	3	9	7	26	40
40% avg	5D/M	0	2	11	10	22	40

Note: Sums of canopy cover by size do not sum to "Total" because of overlapping canopy.

Table 16. Pre- and Post-thinning stand attributes for CWHR 4D/M and 5D/M stands.

CWHR		Stand Attributes						
		Canopy Cover (%)	Trees Per Acre	Basal Area (Sq. Ft.)	Basal Area Retained (%)	Stand Density Index (SDI)	Max SDI	% of Max SDI
Alt A existing	4D/M	52%	760	335	NA	598	818	73%
	5D/M	55%	620	348	NA	615	792	78%
Alt B &C 40% CCavg	4D/M	40%	91	249	71%	311	814	38%
	5D/M	40%	74	246	71%	312	791	39%

Some CWHR 4 and 5 stands adjacent to roads would receive heavier thinning (removal of more trees and thin down to 30% canopy cover) to create open canopy stands and enhance diameter growth of residual trees. Some CWHR 4 and 5 stands that are farther away from roads would receive lighter thinning (less removal of trees and thin down to 50% canopy cover) to maintain closed-canopy stand conditions of later seral stands while reducing ladder fuels and stand density to reduce negative impacts of future fires, drought, and insect and disease occurrences. Canopy cover within RCAs would be maintained.

General Technical Report PSW-GTR-220, page 24 discusses the question of thinning intermediate sized (20- to 30-in dbh.) trees. States that "some research suggests that for managing fuels, most of the reduction in fire severity is achieved by reducing surface fuels (0-9.9"dbh) and thinning smaller ladder-fuel trees. Typically ladder fuels are trees 10- to 16-in dbh. If trees larger than this are thinned, it is important to provide reasons other than for ladder-fuel treatment. These may include additional fuel reduction such as thinning canopy bulk density in strategic locations. Or ecological objectives. There may be socioeconomic purposes for harvesting intermediate-sized trees such as generating revenue to help pay for fuel treatment or providing merchantable wood for local sawmills". On page 25 it states "Attempt to keep pines and hardwoods because of their relative scarcity and importance to wildlife and fire resilience. Avoid riparian zones". A GTR-220 Summary Finding is "Limit use of crown separation in fuel treatments: Sparingly apply canopy bulk density reduction and increased tree canopy separation only in key strategic zones. Current models suggest its effects on reducing crown fire spread are limited, and the regular leave-tree spacing does not mimic tree patterns in active-fire-regime forests".

Aspen Release: Alternatives B and C would improve aspen health and vigor and encourage aspen regeneration by removing overtopping conifer within and adjacent to the aspen stands. Removal of competing conifers allows full sunlight to reach the forest floor and will enhance any natural sucker production that is already occurring in declining aspen clones (Shepperd et.al. 2006). It also has the advantage of retaining any remaining old aspen trees for aesthetic and wildlife purposes (Shepperd 2004).

Alternatives B and C propose to remove the majority of trees within 15 of the 21 acres of aspen units. Approximately 15 acres would go from a CWHR of 4D to 4S and 1 acre would remain as 3S, and 5 acres would only be HCPB and/or underburned. Refer to **Tables 10 and 11**.

> ***A 10-15% canopy cover would be retained consisting of structurally important wildlife trees such as large pine trees with cavities, bayonet limbs, etc.**
>
> ***Under Alternatives B and C, 21 acres are proposed would be reduced to 10-15 % canopy cover. However, of the 21 acres approximately 9.5acres are within RCAs only have the option for HCPB and/or underburn.**

*****Two perennial streams within aspen units, AO1 and AO2, will have an 82 ft buffer with no activity within the first 10 feet and only end-lining out allowed within the outer 72 feet. The other streams within the aspen units are ephemerals and have 10 ft no equipment entry but end-lining out allowed**.

The reason for the high percentage of acres treated within the RCAs is because the majority of the aspen areas is identified as RCA. A secondary treatment of biomass is proposed (refer to discussion below). Buffers are purposefully narrow for streams, spring and meadows in order to accomplish the beneficial treatment of conifer removal. Shading from competing conifers leaves aspen vulnerable to disease and infection, and inhibits successful growth and vitality of aspen suckers as well as mature aspen trees. The intent of the treatment is to initiate aspen regeneration via the removal of competing conifers which stimulates the sprouting process, along with warmer soil temperatures and increased sunlight (Sheppard 1993). Removing conifer competition would meet the specific requirements needed to initiate aspen regeneration as well as provide an ideal microclimate for viable sucker growth (Doucet 1989; Navratil 1991). The intent is to take down the canopy cover down to 10-15 percent and keep trees 30 inches in DBH or larger. The number of miles affected by the aspen release treatment is 0.82 miles. In addition, the headwater reaches of Whiskey Creek in the aspen/meadow area are shallow, shaded and lacking pools. The headwaters are perennial/intermittent but the creeks are only 1-2 feet in depth and water during spring melt and runoff flows over the larger aspen and meadow area but the creeks do not get deeper.

Roadside Hazard Tree: Alternatives B and C propose 115 acres of Roadside Hazard Tree removal (200ft on either side of level 3 roads, paved and moderate use). The CWHR would only change on 0.5 acres from a 3M to a 3P. For all Roadside Hazard Tree units the adjusted RCAs forperennial streams is 150 ft and intermittent/ephemeral streams an 82 ft. with a EEZ of no mechanical treatment allowed. ***Hazard trees may be felled within the EEZ and will be directional felled away from the stream and left on site***. The removal of hazard trees should be much less intensive on the landscape than VDT unless the conditions change by the time the project is implemented. Hazard trees is a safety matter and supersedes most other concerns. Hazard trees must be felled away from streams. A secondary treatment of HCPB and/or Biomass will follow design features above and discussion below. HCPB would not have an exclusion zone for the RCA buffer, however, Biomass will have an EEZ buffer of 150 ft for perennial stream and 82 ft for intermittent streams.

Mastication: Alternatives B and C propose 181 acres of mastication. Mastication focuses on the removal of small and pole size surface and ladder fuels below 10" dbh. The CWHR would only change on 8 acres from a 3D to a 3P. All Mastication units require a EEZ for adjusted RCAs of 82 ft for perennial streams and intermittent streams. There are 53.9 acres outside of the adjusted RCA that will be treated by mastication. This is unlikely to produce additional surface runoff because the treatment creates more surface soil cover which is an important component in the formation and slowing down of runoff. The goal of masticating is that it takes the ladder fuels and it rearranges them to surface fuels. A secondary treatment of HCPB and/or Biomass and/or Underburn will follow design features above (and within Gibsonville Project - Aquatic BEBA) and discussion below. Within the equipment exclusion zone, biomass would not be allowed, hand cutting of conifers up to 10 inches in DBH would be allowed and the piles would be place 25 feet away from any stream bank, and underburning would require preventing fire into 82 of streams. Masticating along RCAs will not change water quality and its beneficial uses. Mastication units will adhere to BMP 1-05 soils LOP and 1-8 stream management zone designation. A secondary treatment of HCPB, underburning and/or biomass is proposed (refer to discussions below).

Handcut, Handpile and Pile Burn (HCPB): Alternative B proposes 345 acres and Alternative C, 435 acres of HCPB. The CWHR would only change on 42 acres from a 3D to a 3M/P. The hand cutting of

shrubs and conifer trees up to 10 inches in DBH removes the saplings and poles trees adjacent to the riparian and within meadows. No riparian vegetation is to be removed. Hand cutting conifers up to 10 inches in DBH applies across the entire project regardless if it's in or out of an RCA. The majority of the difference from Alternative B to Alternative C is that 91 acres proposed for VDT would change to a treatment of HCPB. ***A buffer for RCAs is not required but burn piles must be located a minimum of 25 feet from perennial and intermittent streams, and springs. Piles must be directional lit to allow critters to escape.*** Piles may be piled within the meadow. A HCPB would primarily reduce ground and ladder fuels up to 10"dbh while a VDT treatment would also reduce canopy cover down to an average of 40%. Allthe mechanical treatment units that have HCPB can be treated within the equipment exclusion zone.

As presented in **Table 14**above theaverage percent canopy cover for the understory can change by as much as 20%: 12-14 percent by simply removing the saplings (0-6" DBH) and another 6-7 percent by simple removing pole size trees (6-10 dbh). The assumption is the saplings and poles classes are treated/removed, thereby reducing the surface and ladder fuels. It is a good approximation and representation of how significantly the ground and ladder fuels are reduced by merely HCPB, not including a follow-up underburn. The reduction of ground and ladder fuels will make the forest more fire resilient. Also the reducing the sapling and pole size trees and brush will increase the surface water available for streams, meadows and ponds. Refer to Gibsonville Project - Silviculture(USDA 2016c) and Fire&Fuels Reports (USDA 2016d).The hand treatment within RCAs will not change the water quality or its beneficial uses because the activity does not significant change effective soil cover to promote erosion or the canopy to change the water temperature of steams. The hand cut pile burn treatments within RCAs are intended to help reduce the fuels before underburning. Refer to the Gibsonville Project - Hydrology Report 2016(USDA 2016a).

Meadow & Riparian Restoration: Alternatives B and C propose 25 acres of meadow and riparian restoration. The CWHR would change on 6 acres from a 3M to a 3P. Both alternatives will HCPB shrubs and trees up to 16" dbhwithin the entire riparian allocation area regardless the stream type. ***There are very few trees between 10-16 inches that would need removal.***The main goal is to improve the health of the meadow/riparian habitats. Meadows are a limited habitat type on the FRRD of the PNF. The intent is to remove the encroaching conifers (especially fir) thereby increasing the meadow size and raising the water table. The treatments will improve the water quality and quantity. Piles should be at least 25 ft. from the edge of stream bank or spring but piles may be placed within meadows. Directional light all piles to allow any critters a route for escape.

Underburn: Alternatives B and C proposes underburning on 7 acres as a primary treatment. In addition, underburing is proposed as a secondary treatment on 892 acres under Alternative B proposes and 866 acres under Alternative C. Underburning follows a pre-treatment of thinning or HCPB. There is the potential for a portion of the proposed secondary underburn acres to be biomassed instead. ***Fire will be ignited no closer than 150 ft. away from any stream, spring, and meadow.***Underburn will be allowed to back into these features under the ideal conditions. Monitor and control fire to avoid entry within 82 ft of perennial or intermittent streams. Actively prevent entry in to 82 ft buffer but DO NOT construct handline within 82 ft of streams. The utilization of BMPs, design features and proper buffers for RCAs is crucial to treating within RCAs; this would make them more fire resilient and increase the available surface water.The BMP Evaluation Program from 2010-2012 found that prescribed fire (F25) BMPs were rated at 100 percent for implementation and 97 percent for effectiveness (USDA 2013c). The high success rate of implementation and effectiveness of BMPs when conducting underburns means that the Forest Service met or exceed project identified effective soil cover, and little or no hydrophobic soils and rilling was observed.

Biomass Removal: Alternative B proposes 478 acres and Alternative C 362 acres of biomass removal, as a potential secondary treatment within the VDT, Aspen and Roadside Hazard Tree units. The majority of the 116 acre difference from Alternative B to Alternative C is VDT units which were changed to HCPB or no treatment which does not require biomass as a secondary treatment. Biomass has the same EEZ as primary treatments of 150 ft EEZ for perennial streams and 82 ft EEZ for intermittent and ephemeral streams. There is the potential for a portion of the proposed biomassed acres to be underburned instead. Refer to discussion for underburns above. Biomass removal is the mechanical removal of surface and ladder fuels (trees 3-9.9 inches in DBH). This treatment allows the option for these trees to be sold for small log uses rather than cut, piled and burned on site. There was an assumption made when determining the acres treated within RCAs, that if the treatment is identified with some kind of mechanical treatment then it would fallow those equipment exclusion zone buffers. For example of the 359 proposed for 40%VDT, 125.4 acres are within RCAs and would not have VDT and therefore no biomass.

Tranportation: Under Alternative A, the no action alternative, no new road construction would occur. Alternative B proposes 1.6 miles of new temporary road construction. None of the miles adversely affect a perennial or intermittent stream course. However, in order to access a proposed VDT area,1.2 miles of new temporary road would be constructed through a California spotted owl (CSO) PAC and Territory, and a Northern goshawk (NOGO) PAC. An additional 0.4 miles of temporary road would be constructed to access the aspen stands but would not enter a CSO PAC or Territory, nor a NOGO PAC. Alternative C would only construct the 0.4 mile of temporary road to access the aspen treatment area.

Landings: Under Alternative A, the no action alternative, no landing use or new construction would occur. Alternative B proposes 39 landings: 29 existing and 10 newlyconstructed. The landing are 0.5 acres in size. Alternative C proposes 31 landings: 28 existing landing and 3 newly constructed. The 3 new landings would be constructed in the aspen area. None of the landings adversely affect a perennial or intermittent stream course.

8.3 Large Trees

The SNFPA FSEIS/ROD 2004 includes management direction for retention of large trees, 30 inches dbh and larger.The document discusses the importance of large tree retention for mature/old forest associated species. Large trees are an important habitat component for a multitude of mature/old forest and stream dependent species.

Affected Environment

Of the **3,952** acre analysis area (FS lands only) there are approximately24 trees per acrein the 4D/M stands and 19 trees per acrein the 5D/M stands that are 30 inches dbh andlarger. Refer to **Tables 15 and 16**, above. These numbers were based on information collected during Common Stand Exams within the project area during summer 2015. Large trees are an important habitat component for a multitude of mature/old forest dependent species.It takes approximately 130 years to grow a 30”dbh tree in the Gibsonville Project area (Dunning and Reineke 1933). The District silviculturist, Dan Roskopf, believes that based on growing conditions this assumption applies to the Gibsonville analysis area.

Environmental Effects

No Action: Alternative A

DIRECT and INDIRECT EFFECTS: Under Alternative A, no trees 30 inches dbh and larger would be removed as no treatments would occur. In addition, the large trees, which provide future recruitment of snags and large down wood, would be retained.

Action Alternatives: Alternatives B and C

DIRECT and INDIRECT EFFECTS: In general, no trees 30 inchesdbhand larger are proposed for removal, except for the 23 acres of aspen. In addition, trees 30 inches dbh and larger could be removed for operability and/or if they pose a safety hazard during project implementation. Under Alternative B, 1) it is expected that within the 115 acres of Roadside Hazard Tree Removal many trees identified for removal could be 30"dbh and larger; 2) within the 359 acres of VDT, it is expected that an unknown number could be felled for operability; 3) within the 23 acres of Aspen, it is expected that only a 10-15% canopy cover would be maintained of the larger "wildlife" trees; 4) within the 181 acres of masticationit is expected that an unknown number could be felled for operability but less than for the mechanical thinning; and 5)within the 1.1.6 miles of new temporary road constructionit is expected that an unknown number could be felled. Few trees 30 inches dbh and larger, if any, are expected to be felled withinthe 377 acres of proposed riparian, meadow, HCPBand underburn. The loss of large trees is directly related to the intensity of the action: Alternative B would have a greater effect than Alternative C due to 116 more acres of mechanical thinning for the VDTunits which under Alternative C would be HCPB or no treatment. Alternative B includes greater harvesting but also an additional 3, ¾ acre, new landings andan additional 1.2 miles of temporary road construction over what is proposed for Alternative C. This could remove an unknown number of trees 30 inches dbh and larger.

CUMULATIVE EFFECTS: Across the landscape,the large tree standards and guidelines would be met.

8.4 Snags

The SNFPA FSEIS/ROD 2004 includes management direction for retention of snags. Table 2 of the SNFPA ROD 2004 states "In westside mixed conifer and ponderosa pine types, retain four of the largest snags per acre, larger than 15 inches dbh, clumped and distributed irregularly across the treatment units".

Affected Environment

Common Stand Exams for the Gibsonville project area show that the area consists on average of **11 snags per acre greater than 15"dbh**: 9.5 snags per acre 15-29" dbh and 1.5 snags per acre 30" dbh and larger.These numbers were based on information collected during Common Stand Exams within the project area during summer 2015. Snags are an important habitat component for a multitude of mature/old forest cavity dependent species.**Table 17** displays the current snag data (trees per acre) by diameter classes for the Gibsonville and Thistle Shaft locations.Snags are an important habitat component for a multitude of mature/old forest cavity dependent species.

Table 17. Snag trees per acre by diameter classes and by location.

Location	0-15" DBH (Trees per acre)	15-30" DBH (Trees per acre)	>30" DBH (Trees per acre)	>15" DBH (Trees per acre)	0-99" DBH (Trees per acre)
Gibsonville	50.5	12.0	2.6	14.6	65.1
Thistle Shaft	34.9	7.0	0.5	7.4	42.3

Environmental Consequences

No Action: Alternative A

DIRECT and INDIRECT EFFECTS: Under Alternative A, no snags would be removed. Snag numbers would remain an average of 11 snags per acre for the proposed treatment area. In addition, there would not be a loss of large trees (see large tree discussion above) which are potential snag recruitment trees and future recruitment of large down wood. While maintaining the stand densities in the short-term, this

competition could reduce the recruitment of large trees and future snags and large wood material for the long-term.

Action Alternatives: Alternatives B and C

DIRECT and INDIRECT EFFECTS: Post-treatment the snag numbers are expected to be lower but still meet the minimum standard of four snags per acre, on the landscape. However, snags may be felled for operability and/or safety hazards. It is estimated that half of the snags within the mechanical thin would be retained. Overall, snags would be retained along the unit perimeters or within clumps in the units, where available.Alternative C would reduce the possibility of snag removal for operability or as hazards compared to Alternative B due to fewer acres of mechanical thinning.

CUMULATIVE EFFECTS: Across the landscape, the Snag standard and guideline would be met.

8.5 Large Down Wood

Table 2 of the SNFPA ROD 2004 states: Within westside vegetation types, generally retain an average over the treatment unit of 10-15 tons of large down wood per acre (equivalent to 8-12 logs per acre ≥ 20-inch dbh and 10 foot in length or longer),with an emphasis on retention of wood that is in the earliest stages of decay.

Affected Environment

Large Down Wood is an important habitat component of forests for a multitude wildlife and aquatic species.Analysis based on common stand data show that on average the units within the project area consists of an average of **9 tons per acre**(≥ 20-inch diameter and 10 foot in length or longer). Refer to **Table 18**. These numbers were based on information collected during Common Stand Exams within the project area during 2015. Numbers from 2013 soil transects show similar tons per acre. High quantities of downed large woody material are not expected to exist equally across the landscape. Overall, less productive soil types, such as exposed sites including ridge tops or south-facing slopes and areas with shallow or erosive soils, are expected to have less downed large woody material due to more open forest cover and slower growth rates of vegetation. Productive sites are capable of growing vegetation more quickly and produce high tree sizes, and densities associated with mortality.

Table 18. Large Down wood data from Common Stands Exams for Gibsonville area.

Common Stan Exam Plot Area	Tons per acre	# Logs per acre	Cubic Volume per acre
Gibsonville	14.285	7	571.4
Thistle Shaft	3.5475	3.7	141.9
Average	**8.925**	**5.4**	**357**

Environmental Consequences

No Action: Alternative A

DIRECT and INDIRECT EFFECTS: Under Alternative A, no Large Down Wood (LDW) would be removed. Also, no future log recruitment trees such as snags and large trees 30" or greater would be removed for operability or as safety hazards. Depending on each stands density and tree sizes, tree growth could be affected at varying rates due to competition for nutrients and space. While maintaining the stand densities in the short-term, this competition could reduce the recruitment of large trees and future snags and large wood material for the long-term.

Action Alternatives: Alternatives B and C

DIRECT AND INDIRECT EFFECTS: The SNFPA ROD 2004 standard and guideline for large down woody material is not met within the Gibsonville project area.Presently the project area is at 9 tons per acre (≥ 20-inch diameter and 10 foot in length or longer) which is below the minimum requirement of 10-15 tons per acre and the desired condition of over 20 tons per acre CSO and NOGO PACs**.** Under the action alternatives, LDW is not specifically proposed for removal but a portion is expected to be removed for operability. Also,future log recruitment trees such as snags and large trees 30" or greater could be removed for operability or as safety hazards.This is expected to occur more on Alternative B which has 116 additional acres of VDT than Alternative C. A design feature would be in place to **not YUM** (Yard Un-merchantable Material) logs 20"diameter and 10' length but to leave the cull logs to meet the large down wood standard, where feasible. The C clause, C6.7,will be used for all proposed treatment units. The contractor will be required to leave 8-12 logs per acre, which generates approximately 10-15 tons per acre, that are 20 inches or greater at the small end diameter and 10 feet long or longer. Logs will be evenly disturbed within units to the extent possible. However, it is expected that the snags and large trees that would be removed for operability and/or safety hazards which would have eventually fallen and contributed to the tons per acre. Since it is not know exactly how many logs could be recruited as a result of the no YUM design feature it is unknown whether more logs could be recruited if there was no treatment, and any large trees and snags that could be removed for operability or as safety hazards were retained.

CUMULATIVE EFFECTS: Across the landscape the large down wood would be below requirements.

8.6 Hardwoods

The SNFPA FSEIS/ROD 2004 includes management direction for retention of hardwoods. Site specific planning will determine feasibility and specific needs. Retain smaller oaks, if determined to be necessary for future recruitment. Page 52 of SNFPA ROD 2004 states "During mechanical vegetation treatments, prescribed fire, and salvage operations, retain all large hardwoods on the west side except where: (1) large trees pose an immediate threat to human life or property or (2) losses of large trees are incurred due to prescribed or wildland fire. Large montane hardwoods are trees with a DBH of 12 inches or greater.

Affected Environment

Of the **3,952** acre analysis area (FS lands only) consists on average of **1%**black oak. These numbers were based on information collected during Common Stand Exams within the project area during 2015. Hardwoods are a critical habitat type for wildlife. Oaks (Quercus spp.) may be the single most important genus used by wildlife for food and cover in California forests and rangelands, and black oak occupies more total area in California than any other hardwood species. The physical structure of oak communities determines the availability of shelter, nesting sites, and corridors for travel. Wildlife use oaks as places to hide, shade, and escape from predators and from fires (Pavlik et al. 1991). Large diameter black oak is lacking in the greater than 15 inch diameter classes. This species provides wildlife habitat and contributes to vegetative species diversity. California black oak is shade-tolerant in early life, but as the oak tree ages, it becomes more shade tolerant. If overtopped, the oak either dies outright or dies back successively each year. With continued overtopping, death is inevitable (Burns and Honkala 1990). Retention of oaks includes oaks eight inches in diameter and greater, especially those areas where the basal area is not met.

Environmental Effects

No Action: Alternative A

DIRECT and INDIRECT EFFECTS: Under Alternative A, no hardwoods would be removed as no treatments would occur.

Action Alternatives: Alternatives B and C

DIRECT and INDIRECT EFFECTS: There are few hardwoods within the project area, less than 1% of the area. The action alternatives do not propose to remove any hardwoods. However, if there are any hardwoods within the VDT or mastication and they are under 10"dbh they could end up removed.

CUMULATIVE EFFECTS: Across the landscape the large tree standards and guidelines would be met.

8.7 Road Density

Affected Environment

Roads and trails were compiled to determine the number of miles and density by subwatershed to get an overview of their impact on the landscape (refer to Gibsonville Project - Hydrology Report 2016(USDA 2016a). The complied data came from road surveys, our corporate layers, and aerial photos. Due to the high road density, road surveys were conducted in 2012, 2013, and 2015 but the majority of the surveys occurred in 2012. **Table 19** indicates that the average density of roads for the watershed analysis area is 3.3 miles of roads per square mile.

Table 19. Road density (miles per square mile) by subwatershed.

Sub-watershed		ROAD DENSITY			
#	Name	County	Forest Service System	Unclassified	Total
1	Whiskey Creek	0.1	3.8	0.3	4.2
2	Union Keystone	1.2	1.4	0.8	3.4
3	Gibson Creek	1.9	1.0	1.4	4.3
4	Slate Creek	1.1	1.4	2.2	3.7
5	Wallace Creek	0.0	0.1	0.6	0.7
	Total	**4.3**	**7.7**	**5.3**	**16.30**
	Average	**0.9**	**1.5**	**0.6**	**3.26**

Roads modify drainage networks and accelerate erosion processes, resulting in the alteration of physical processes in streams. These changes can be dramatic and long lasting and can degrade water quality and aquatic habitat. Roads can directly affect water quality and aquatic habitat by altering flow, sediment loading, sediment transport and deposition, channel morphology, channel stability, substrate composition, stream temperatures, and riparian condition in watersheds. Common problems on roads include rutting, blocked drainages, lack of placement of BMPs, and entrenchment of roads. The existing road density within the analysis area and associated stream crossings and culverts has caused fragmentation to the hydrology and aquatic habitat. Ecological processes that occur in the hyporheic zones (where water and land meet in saturated sediments beneath and beside a river channel) have strong effects on stream water quality. Rivers with extensive hyporheic zones retain and process nutrients efficiently, which has a positive effect on water quality and on the ecology of the riparian zone. Scientific research emphasizes the importance of maintaining connectivity between the channel, hyporheic, and riparian components of river ecosystems. When human actions, such as encasing streams in pipes, sever those connections, the result is poorer water quality and degraded fish and aquatic species habitat downstream. Stable streambanks sustain desired habitat diversity and minimize erosion and sedimentation into streams.

However, the physical structure and condition of some streambanks has degraded due to poorly maintained or improperly designed roads and stream crossings and heavy impacts from recreational uses. At these locations there is an alteration in flow, sediment loading, sediment transport and deposition, channel morphology, channel stability, substrate composition, and riparian condition, leading to degradation of water quality and aquatic habitat.

Environmental Effects

No Action: Alternative A

DIRECT and INDIRECT EFFECTS: Under Alternative A, no new roads would be constructed as no treatments would occur.

Action Alternatives: Alternatives B and C

DIRECT and INDIRECT EFFECTS: The SNFPA FSEIS and ROD 2004 provides multiple directions and Standards and guidelines for the importance of controlling road density within wildlife and aquatic habitat. The density numbers are rated as good, fair or poor based on the Washington Office (WO) Forest Service Watershed Condition Classification Assessment (WCA) Guide (USDA Washington Office 2010). The following are how road densities are rated:

- Good = Road density < 1 mi/mi^2
- Fair = Road density of 1 – 2.4 mi/mi^2
- Poor = Road density > 2.4 mi/mi^2

The watersheds within the analysis area have a road density that does not meet the desired condition for minimizing road impacts to aquatic and riparian environments.Based on the average density of roads the overall rating for the five subwatersheds is poor. No road decommissioning is presented or analyzed in the report because it was not part of the purpose and need. Alternative B proposese1.2 miles of new temporary road construction. While Alternative C proposes 0.4 miles of new temporary road construction. Temporary roads are expected to be closed post-project completion but many temporary roads once constructed are retained and many of those become FS system roads.

CUMULATIVE EFFECTS: Across the project areathe road density standards would **NOT** be met.

8.8 Aquatic& Riparian Habitat

Refer to Gibsonville - Aquatic Biological Assessment and Biological Evaluation for the Aquatic & Riparian discussion and analysis. Aquatic and Riparian habitat are critical habitat types for all Wildlife species.

8.9California Spotted Owl

Affected Environment

Status:

USFS:The California spotted owl (CSO) is currently a USFS Region 5 Sensitive Species.

Petition to list the California spotted owl:On August 19, 2015 the United States Fish and Wildlife Service (USFWS) received a petition from the Sierra Forest Legacy and Defenders of Wildlife, to list the CSO as endangered, and requested designation of critical habitat for the species.

In the Federal Register, Vo. 80, No 181 on Friday, September 18, 2015 the USFWSannounced in a 90-day finding that a "petition to list the CSO presented substantial scientific or commercial information indicating that the petitioned actions may be warranted. Therefore, with the publication of this notice, we

are initiating a review of the status of the species to determine if the petitioned actions are warranted. Based on the status review, we will issue a 12-month findings on the petitions, which will address whether the petitioned action is warranted as provided in section 4(b)(3)(B) of the Act.

Excerpt from the "California Spotted Owl Conservation Strategy" briefing paper. USDA. USFS. Pacific Southwest Region. December 2015:In January 2004, the Forest Service signed the Record of Decision for the Sierra Nevada Forest Plan Amendment (Sierra Nevada Framework). The decision amended the Forest Plans for 11 national forests to improve protection of old forests, wildlife habitats, watersheds and communities in the Sierra Nevada Mountains and Modoc Plateau. Visit our website on the Sierra Nevada Framework for more information. In October 2014, the Forest Service and environmental plaintiffs signed a settlement agreement ending a decade-long legal battle over the Sierra Nevada Framework. The settlement agreement includes terms related to the development of conservation strategies for the Pacific fisher and the CSO, a memorandum of understanding for the increased use of managed fire, and analysis of forest plan components for post-fire habitat. Several of these efforts, including the development of a CSO Conservation Strategy, were in progress before the settlement agreement was reached. You can read the news release about the settlement agreement for more information.

The California spotted owl (CSO) has long been a species of conservation focus in the Pacific Southwest Region of the Forest Service, with the species having been designated as a Forest Service Sensitive Species in the late 1970s. In July 1992, the Pacific Southwest Research Station published a General Technical Report titled The California spotted owl: a technical assessment of its current status. This document provided the scientific foundation for conserving the species for the last 23 years.

Since the publication of the 1992 report, a great deal of scientific information and management experience has developed that warrants a renewed look at the best means of conserving the species. For example, the proportion of stand-replacing fires and high severity burn patch sizes have been increasing in the Sierra Nevada over the last three decades (Miller et al. 2009, Miller and Safford 2012, Steel et al. 2015), and around 15% of PAC acres have burned since 1993 (Keane in review). Barred Owls populations have also now been detected in the Sierra Nevada (first detection 1991; Dark et al. 1998), have been increasing in recent years (Keane unpublished data), and have recently been implicated in the population declines of the closely related Northern Spotted Owl (Dugger et al. in Press). And, perhaps most importantly, CSO populations on the three demographic study areas occurring primarily on national forest lands in the Sierra Nevada appear to have declined over the past 20 years, suggesting that this renewed look at CSO conservation is needed (Connor et al. 2013, Tempel and Gutierrez 2013, Tempel et al. 2014).

Given the importance of species conservation to developing and revising land and resource management plans (forest plans), a new California Spotted Owl Conservation Strategy can help inform the forest plan revisions currently in progress and planned for the future.

The CSO Conservation Assessment is a summary of scientific information related to the CSO and its conservation. The Pacific Southwest Research Station has taken the lead to prepare the Conservation Assessment and expects to finalize it in fall 2015. The Conservation Assessment is not intended to provide management recommendations for the species, but is instead intended to provide a strong scientific foundation upon which the CSO Conservation Strategy can build to develop management recommendations and other tools to help conserve the California spotted owl. When it is available it will be posted to the Conservation Strategy website including a list of the references used.

The CSO is not currently listed as a Threatened or Endangered Species under the federal Endangered Species Act. However, there are two petitions currently pending before the U.S. Fish and Wildlife Service to list the species (USFWS CSO website). The Fish and Wildlife Service is responsible for determining

whether to list the species and will do so according to its statutory and regulatory processes. We intend to develop the CSO Conservation Strategy in close coordination with the Fish and Wildlife Service, and hope that the CSO Conservation Strategy will be useful in informing the Fish and Wildlife Service's listing process. Regardless of whether the CSO becomes federally listed, the CSO Conservation Strategy will be designed to help protect and conserve the CSO and the forests in which it lives.

We intend the CSO Conservation Strategy to offer management and conservation recommendations for forest managers to consider when planning activities and uses in national forests. We expect the Conservation Strategy to be adaptive and flexible to reflect new opportunities, lessons learned and the best available science. The Conservation Strategy will be considered in decisions on Forest Plans and projects.

Surveys

California Spotted Owl surveys for the Gibsonville project area were covered under the larger surveyed Sugarberry project area; contracted to Williams Wildland Consulting for the 2011 and 2012 seasons. In 2011 and 2012,one single male was detected near**PAC SIE0046** (Wallace Creek);a pair of owls were detected within and near **PAC SIE0069**(Sawmill Ridge); andmultiple owl pairs were detected within **PAC PLU0184** (Slate Ck–Yankee Hill). Proposed treatment areasencompassingportions of SIE0069 and PLU0184 were later dropped from the Gibsonville project area.In 2011 a pair was located outside of an established PAC southwest of the **Gibsonville Cemetery**. In 2011 and 2012, on separate survey visits, single females and males, were detected in Gibson Creek-Gibsonville area.

Additional CSOsurveys were done by FS crews in 2013. A single female was detected in the Gibsonville Cemetery area, and a nest with a pair and two fledglings located in SIE0069.

Additional CSO surveys are being conducted by FS crews in 2016 within and around: 1)the aspen area which is not within a CSO PAC or Territory but has potentially suitable habitat; 2) SIE0046 to acquire more recent activity center information; and 3) Gibsonville Cemetery to see if pair can be relocated. However, due to access issues (snow and then downed trees), surveys wereconducted late and not to protocol. Surveys would be required in spring FY17, or when area is accessible.

Analysis Area Occurrence Potential

Definitions of suitable habitat are derived from those listed in Verner et al. (1992), USDA 2004, and 70 Federal Register, June 21, 2005. Based on these definitions the following CWHR types in the analysis area provide nesting habitat: Sierran Mixed Conifer, White Fir, and Ponderosa Pineforest types with CWHR 5D, 5M: size classes 5 (> 24 inch DBH) and canopy cover that is Moderate (40-59 percent) to Dense (50-100 percent). These CWHR types have the highest probability of providing stand structure associated with preferred nesting, roosting and foraging. Suitable foraging habitat is found in the same forest types listed above for nesting habitat (CWHR 5D, 5M) as well asCWHR 4D, 4M: size classes 4 (11-24 inch DBH) and canopy cover Moderate (40-59 percent) to Dense (50-100 percent). Stands considered to be suitable for foraging have at least two canopy layers, dominant and co-dominant trees in the canopy averaging at least 12 inches in dbh, at least 40 percent canopy closure, and higher than average levels of snags and downed woody material. Ridge-tops are usually not suitable for nesting or roosting habitat but is utilized for foraging.

The California Spotted Owl Module: 2010 Annual Report for the Plumas-Lassen Administrative Study (PLAS) area notes that: 1) approximately 53% of the nest sites were located within CWHR 5M, 5D and 6"; 2) of the nests located in size class 4 stands included large tree component (i.e., presence of >24" DBH trees); 3) overall, 90% of the nest sites were located in CWHR 4M,4D,5M,5D and 6 size classes;

and 4) the remaining10% sites were in more open, smaller-tree sizes with nests or roosts located within remnant, scattered larger trees (USDA 2011).

Owls are managed through the establishment of Protected Activity Centers (PACs) and Territory (formally identified as Home Range Core Areas (HRCAs)). The PACs are 300 acres in size and designated for owl activity centers based on criteria described in California Spotted Owl (CASPO) technical report (Verner et al. 1992). The Territories on the Plumas National Forest are 1,000 acres in size, comprised of the 300-acre PACs and 700 acres of the best available habitat around or adjacent to the PAC (SNFPA FEIS 2001; SNFPA FSEIS 2004). Under the Interim Recommendations for the CSO, an additional 100 acres are proposed to be managed for alternate nesting habitat and a minimum of 50% canopy cover for foraging habitat within the Territory.

The habitat type in the study area is comprised primarily of Sierra Mixed Conifer andPonderosa pine (*Pinus ponderosa*) at the lower elevations to true true fir (white and red fir) at higher elevations. Refer to **Tables 7 and 8** above.White Fir, with varied mix of aquatic and riparian habitat. The Gibsonville terrain consists of gentle to very steep slopes and non-forested areas in the Slate Creek drainage, including some aspen, meadows, rock outcrops and brush fields. Nesting pairs found within the Gibsonville project area typically use habitat consisting of mature to older forest, mixed conifer, with well-developed under story and a moderate number of snags (>8 per acre) and large logs (>20 tons per acre). Atypical areas where owls may be found are in disturbed areas where logging, historic and active mining, recreation (campgrounds, off road vehicles) and high vehicular traffic occur.

The area has been altered due to past logging, recreational use, fire suppression, mining, and road construction. In many cases, the forests have become so dense with smaller trees and brush that fire cannot safely or successfully be reintroduced without first reducing fuel loads. Too dense an understory makes it difficult for owls to hunt; on the other hand, some amount of understory vegetation provides cover for a diversity of prey for the owl.

There is habitat within the Gibsonville analysis area includingthe treatment units that is suitable for owls to nest and forage. The analysis area is **3,952 acres**, FS only. Of the 3,952 acres there are **2,364 acres**CWHR classified as suitable habitat: 567 acres as suitable nesting habitat (5M,5D) and 1,797acres as suitable foraging habitat (4M,4D). Refer to **Tables 8 and 9** above. There is also approximately 1,588acresof unsuitable habitat within the analysis area, predominately due to steep and rocky Slate Creek drainages. However, stand typing changes when looking at aerial photographs and Google Earth images, as compared to forest CWHR typing.Within the 3,952 acrewildlife analysis area there are four CSO PACs associated with the analysis area. Two PACs are within or partially within the analysis area and two PACs are not within but small portions of their Territory are withinthe analysis area. Refer to **Figure 5**which shows the location of the PACs, Territories, management areas and available suitable habitat:

- **PAC SIE0046**(Wallace Creek)and its associated Territory is completely within analysis area. This PAC is 445 acres in size. *******An additional 100 acres were added following CSO IR and another 50 acres to include outlying activity centers.***
- **PAC SIE0069**(Sawmill Ridge) is about 60% within analysis area. Only a few acres of its associated Territory is within the analysis area. This PAC is 307 acres in size.
- **PAC PLU0192**(Headwaters South Fork Feather River) is not within the analysis area, however, afew acres of its associated Territory is within the analysis area. This PAC is 310 acres in size.
- **PAC PLU0184**(Slate Creek–Yankee Hill) is not within the analysis area, however, afew acres of its associated Territory is within the analysis area. This PAC is 303 acres in size.
- **PAC potential (Gibson Creek) needs additional surveys to confirm it is a separate PAC or part of SIE0046.**

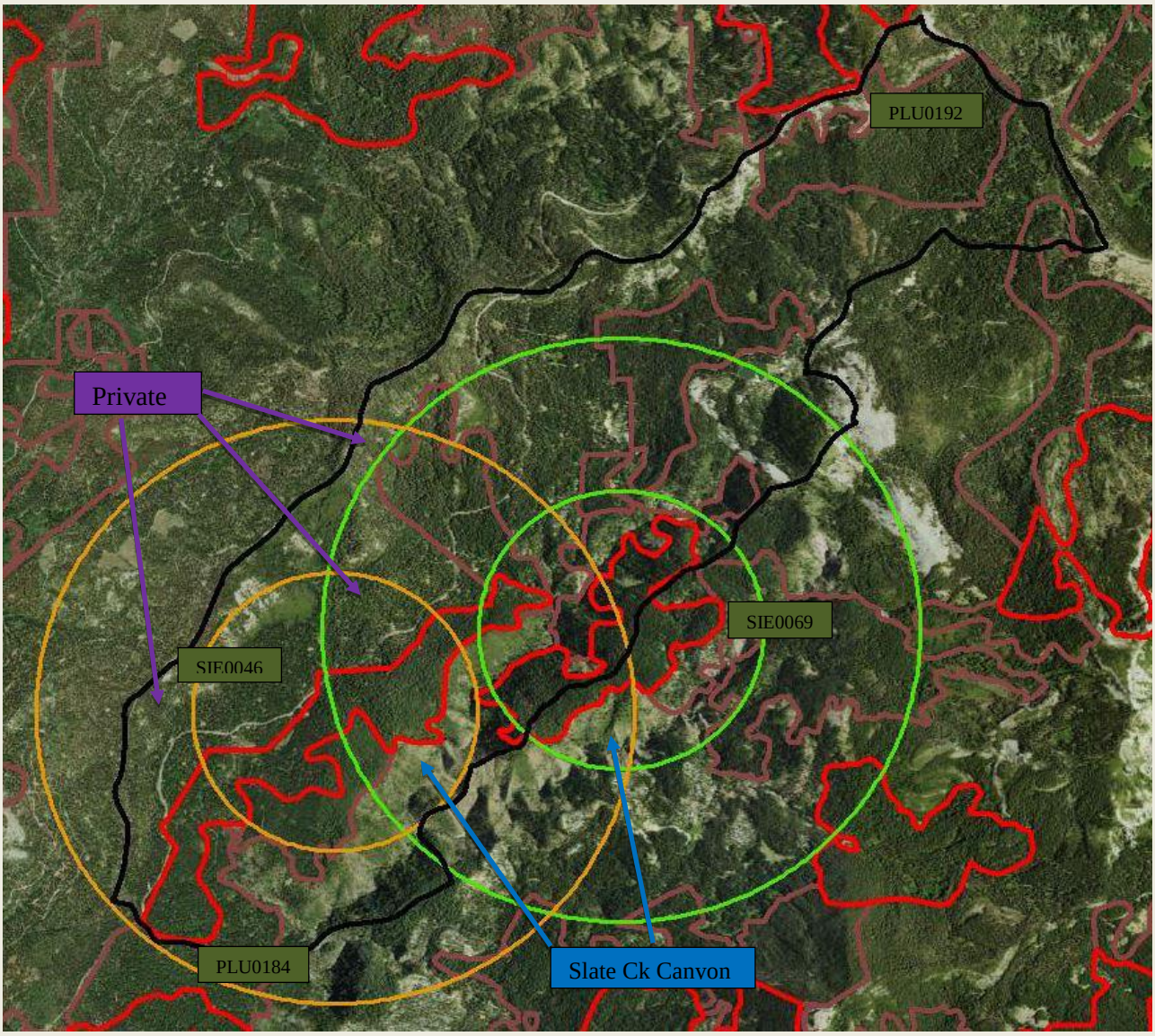

Figure 5. Location of PACs, Territories, management areas(0.7 mile) and available suitable habitat.

Environmental Consequences

The following is an analysis of the effects of the no action alternative and two action alternatives.The main purpose and needs of the proposed action is to reduce fuels, restore aspen/meadow habitat, and thin out vegetation and remove hazard trees along roads.

No Action (Alternative A)

DIRECT AND INDIRECT EFFECTS:The No Action Alternative would have no short-term changes in nesting habitat for the CSO. Alternative A would allow succession to move the forest toward denser stand conditions thus reducing the amount of fragmentation within the area of connectivity for the CSO.

As succession continues, natural stand processes would enhance the complexity, and potentially improve both roosting and nesting characteristics. In addition, it would enhance foraging habitat by providing more diverse stand conditions conducive to CSO and/or their prey species.

Closed-canopy old growth stands are favored by CSOs and are less flammable, because the dense canopies maintain higher relative humidity within the stands and reduce heating and drying on surface fuels by solar radiation and wind. However, fires are unpredictable and are subject to spreading depending on the orientation of the landscape and prevailing winds. Ladder fuels, can also play a large role as to whether the fire reaches the canopy of large trees.

Over the long-term, forest vegetation would continue to grow, increasing canopy cover of dominant and co-dominant trees. Mortality in intermediate and suppressed trees would increase, resulting in more snags and dead and down logs. These changes would benefit species such as the CSO, northern goshawk, and forest carnivores, which are associated with late-succession forests. These long-term changes in forest structure could lead to an increase in fuel hazards and increase the probability of a stand-replacing fire in the future. The loss of late-succession forests could eliminate habitat for species associated with those forests.

Maintenance activities would not occur which could cause behavioral disturbances to the nesting and roosting sites. Large trees, 30”dbh or greater would be retained. Snags and large down logs would continue to accumulate, contributing to habitat diversity. Conversely, wildlife would continue to be threatened by habitat loss from potential wildfires due to high amounts of surface and ladder fuels.

CUMULATIVE EFFCETS: The No Action Alternative for the Gibsonville Project would not provide for the long-term protection of California spotted owl habitat from wildfire. There would be no actions designed to reduce the risk of high intensity wildfire (based on analysis conducted inSNFPA FEIS (2001). There would be no thinning that could enhance the growth of dominant and co-dominant trees that may provide future habitat availability.

Action Alternatives: Alternatives B and C

DIRECT and INDIRECT EFFECTS: Alternatives B and C may affect the CSO but are not likely lead to a trend toward listing or loss of viability for the species based on the amount and intensity of the proposed treatments and applied design features (protection measures).There are no mechanical treatments proposed within PAC under both action alternatives. The affects are less for Alternative C as compared to Alternative B. The major difference between Alternatives B and C is that 116 acres proposed for VDT 40%under Alternative B are proposed for HCP or no treatmentunder Alternative C. These 116 acres are within designated CSO Territories. Alternative C would have less of an affect than Alternative B because there are no VDT 40% treatments proposed within Territories. Alternative Cprotects habitat for new activity centers and maintains habitat with in owl Territories. A major difference between the no action and action alternatives is that the aspen restoration would not occur and it is expected that the aspen habitat could be lost within the area based on the existing state of decline. Also, the fuels reduction would not occur and wildlife & aquatic habitat could be lost due to potential wildfires and drought (low water and high temperature) conditions.The CSO is not expected to be directly affected and indirect effects are expected to be lowbased ondesign features(including direction, standard and guidelines, and protection measures)such as thefollowing:

Alternatives B and C

- CSOPACs have been established to encompass all known activity centers.

- If new activity centers are located, PACs would be adjusted to include the activity centers or a new PAC created.
- Protocol level surveys were conducted over a 2 year period in 2011-2012 and additional surveys in 2015-2016 within the Gibsonville project wildlife analysis area. Additional target surveys are planned for 2017 for areas of highly suitable habitat not within PACs or Territories.
- Protection measures such as Limited Operating Periods, no activity between March 1 and August 15th, would be in place to prevent disturbances to nesting or roosting owls.Operations shall be evaluated within ¼ mile of activity centers to prevent disturbance to species during the breeding season. If nesting status is determined, the limiting operating period (LOP) will be applied to ¼ mile around the nest stand, or as determined by the District Biologist.
- If any new owl activity centers are detected during implementation of the project, the District Biologist will be notified for further evaluation before continuing operation.Any activity with the potential for disturbance would be limited to individual treatment units and would last a few days to two weeks in any location. Impacts from disturbance are not expected to substantially affect habitat use or reproductive capacity of this species.
- No mechanical thin treatments are proposed in CSO PACs.
- No mechanical thin treatments are proposed within northern goshawk PACs, which may also provide suitable CSO nesting (and foraging) habitat.
- Almost half of the mechanical thin treatments which reduce canopy cover are along access roads which are not optimum for nesting habitat due to higher levels of disturbance or along ridge-tops which are not considered preferred nesting habitat.
- Large Trees: trees 30 inches dbh and greater would be retained, except for operability and safety
- Snags: 4-6 snags per acre, 15 inches dbh or greater would be retained, where feasible.
- LDW: 10-15 tons per acres of large down logs would be retained, where available, and no YUM.

Alternative C

- Alternative C: No mechanical thinning is proposed within CSO Territories.
- Alternative C: No new landings or road construction are proposed in CSO PACs.

Protected Activity Centers (PACs) - There were limited options for placement of the PACs and their associated Territories due to the availability of suitable habitat (including steep and rocky Slate Creek drainage to the southeast) and avoiding private lands (to the westand other isolated parcels), and major high-use paved roadways. Direct effects analysis focuses on the fact that there is no Mechanical Thin entry proposed in PACs that currently exist or were created as a result of historical (prior to 2011) surveys. Only treatments that maintain or improve habitat structure and composition are proposed. The effect to potentially suitable nesting and foraging habitat outside of established PACs was considered as indirect effects based on the assumption that the extensive surveys, following Region 5 Protocol, would have detected activity centers.The Gibsonville analysis area for the CSO includes one PAC within and one PAC partially within the analysis areas, and two PACs which have a few acres of their associated Territories within the analysis area. New activity centers have been located east of Gibson Creek. Due to private lands to the west, the steep and rocky Slate Creek drainage to the east, past harvesting and high level use paved road there is limited habitat for the establishment of another PAC on FS lands. Anoption is to drop a portion of the southern end of PAC SIE0046 (which does not have activity centers) and add to the northern end of the PAC by extending along the east side of Gibson Creek to include the additional new activity centers. ***PAC SIE0046 has an additional 100 acres added for a total of 445 acres to meet IR but the boundary would have to be modified to include new activity centers.Alternative C

keeps this option open withhandcut treatment with a LOP. Alternative B does not keep options open as a result of the VDT 40% treatment.

Territories - The amount of private land and non-suitable habitat on FS lands (water, rock, etc.) limits the land available to establish Territories around the CSO PACs within the project area. Refer to the discussion below for direct and indirect effects on nesting (5D/5M) and foraging (4D/4M) habitat. Based on the number of acres treated and the level of effect that is proposed in individual RCAs, it is difficult to predict if there would be a shift in owl use due to habitat alteration. In addition, due to the large amount of private land adjacent to the PACs in some cases there are not enough Forest Service lands, let alone suitable, surrounding PACs to provide for 700 aces of foraging habitat for each owl PAC. In addition, some of the FS lands that do surround PACs are not classified as suitable foraging habitat. Because of the limited habitat available to designate as Territory, some of the Territories are stretched out, tightly placed, and/or adjacent to each other.

Mechanical Thin treatments within CSO Territories assume a risk to the CSO because the treatment reducesthe quality of suitable habitat. Alternative B would have the greatest short and long-term negative effect on owl habitat as a result of reducing canopy cover down to 40% canopy cover in size class 4s and 5s on 116 acres within Territories. Alternative C does not have mechanical thin units within Territories. Alternative C would therefore not reduce the quality of the habitat within Territories while having a positive effect by reducing fuels, removing or thinning out dense stands of fir and increasing the fire-resistant pine component while maintaining at least the minimum levels of habitat suitability in the short-term and long-term.Also, the proposed action is intended to reduce the long-term risk of the loss of habitat due to fire and diseaseand restore aspen habitat which benefit habitat for owl prey.Refer to "Design Features and Mitigations" above. Refer to **Tables 7-9** above, and **Figures6 and 7** below.

- Of the 3,952 acre analysis area, there are**2,364** acrestyped as suitable CSO habitat.
- Of the 1,200 acres proposed treatment,there are**991**acrestyped as suitable CSO habitat.

"Mechanical Thin Treatments"
(Variable Density Thin and Aspen Release)

Of the 2,364 acres of suitable CSO habitat within the analysis are; Alternative B would reduce 294 (12%) acres and Alternative C reduce 224 acres (9%) to minimal suitability by Mechanical Thinning-Variable Density Thin. Both action alternatives would take 21 acres to below suitability by Mechanical Thin - Aspen Release. The number of acres treated and the percent of canopy cover reduction under Alternative B could have a greater impact on owls then Alternative C. Alternative C reduces fewer acres of suitable habitat and retains higher canopy covers and multi-story layering. Acres proposed for VDT 40% treatment under Alternative C, are predominately along a high-use forest road, historic Gibsonville Townsite where the objective is to protect townsite by reducing fuels and hazard trees, and surrounding an aspen area where the goal is to restore aspen habitat by raising the water table, reduce shadingand reducing the nutrient competition,by reducing the tree density within forest surrounding the aspen habitat.Refer to **Tables 10-14** and **Figures 4 and 5,** and Terrestrial Habitat discussionabove, and **Figures 6 and 7**, **Table 20** and discussion textbelow.It is unknown the number of trees 30" dbh or greater that could be removed for road or landing construction, or for operability. According to the district Silviculturist trees over 30" dbh are avoided wherever possible due to ecosystem objectives and removal cost when constructing roads and landings.

***Included within the proposed 359 acres of Mechanical Thin under Alternative B there are 108 acres of RCA. The 108 acres would not be thinned to 40% but would be HCPB and/or underburning.Therefore, the total maximum acres of Mechanical Thin is actually 251acres and**

therefore the number of acres of suitable habitat reduced to 40% would be less as well. Refer to Tables 3, 11 and 20, and Figure 4 above. Alternative C has only a few acres of RCA proposed for HCP and/or UB versus VDT 40%.

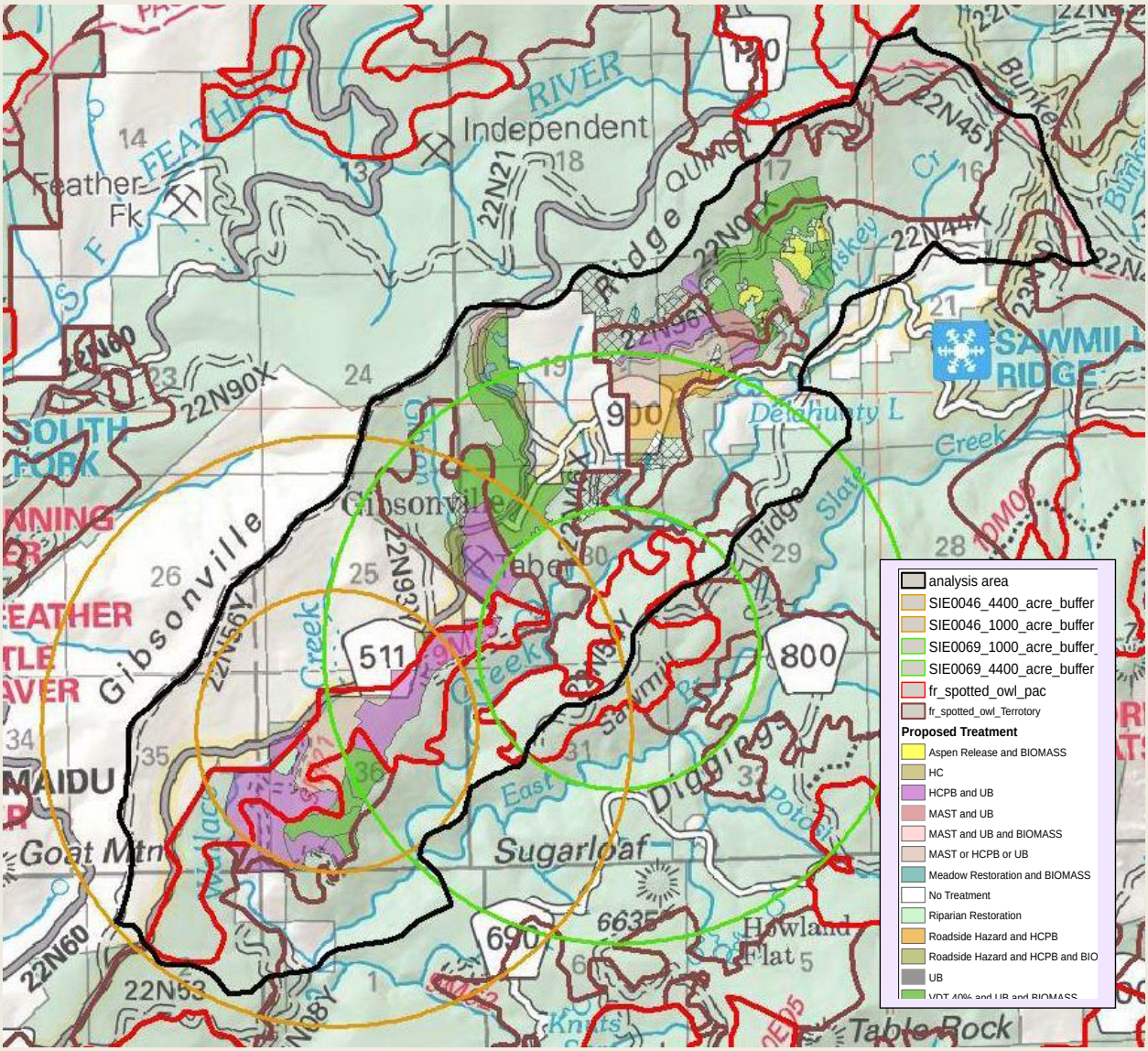

Figure 6.Alternative B: Location of Ca. spotted owl PAC and Territories within Gibsonville analysis area with proposed treatment units. *Greenand yellow shading is the proposed Mechanical Thin units. All other color coded units are non-mechanical, fuels reduction treatments.

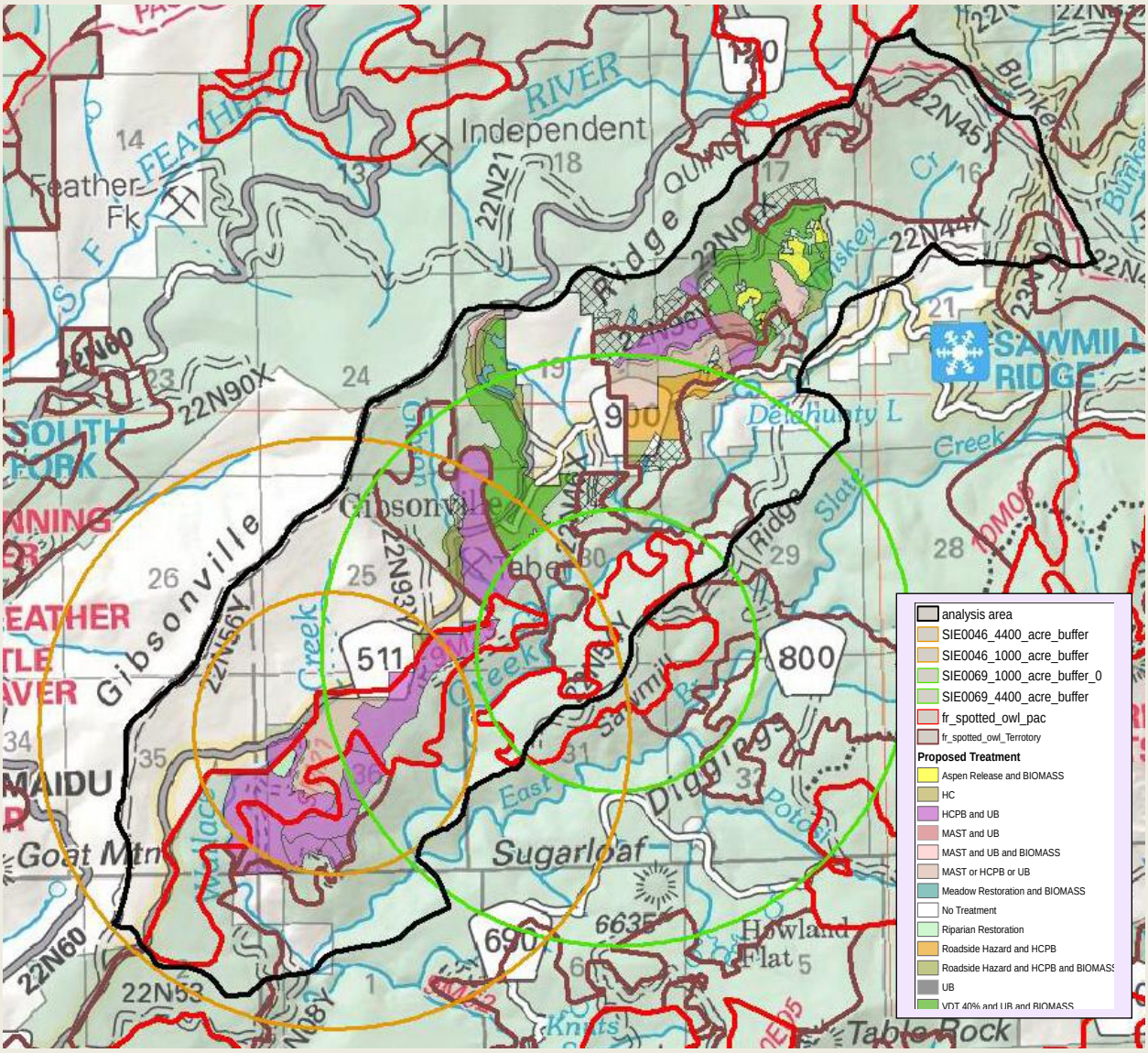

Figure 7.Alternative C: Location of Ca. spotted owl PAC and Territories within Gibsonville analysis area with proposed treatment units.*Greenand yellow shading is the proposed Mechanical Thin units. All other color coded units are non-mechanical, fuels reduction treatments.

Table 20. Pre and Post-treatment landscape structure (CWHR size and density classes) acres by Mechanical Thin.

Mechanical Thin (VDT 40% and Aspen Release)		
Alternative A	**Alternative B**	**Alternative C**
Nesting Habitat		
147 acres of 5D	147 acres of 5D is reduced to 5M	119 acres of 5D is reduced to 5M
Foraging Habitat		
147 acres of 4D	147 acres of 4D is reduced to 4M	105 acres of 4D is reduced to 4M
21 acres of 4D	21 acres of 4D is changed to 4S	21 acres of 4D is changed to 4S
5 acres of 4M	5 acres of 4M remains as 4M	5 acres of 4M remains as 4M
total = 320 acres	**suitability reduced = 294 acres** **below suitable = 21 acres** **suitability maintained = 5 acres**	**suitability reduced = 224 acres** **below suitable = 21 acres** **suitability maintained = 5 acres**
	PACs = no acres proposed **Territories = 115.4 acres reduced** *There are only a few RCAs within the Territories so only a few acres buffered and treated by HCPB instead of VDT40%.	**PACs = no acres proposed** **Territories = no acres proposed**

- **Suitable CSO Habitat**
  Habitat is reduced to minimal suitability on **294** acres under Alternative B and **224** acres under Alternative C. The CWHR size class of 4 and 5 is retained but density is reduced from D to M (minimum of 40%). *Past monitoring of habitat taken to 40% canopy cover has shown that it is not even selected for foraging by owls. Also, habitat is reduced to below suitability on **21** acres for aspen release.
    - Nesting Habitat (5D and 5M)
      - ***Alternative B***
        - ✓ **5D to 5M:**Canopy cover would be reduced on **147** acres of suitable nesting habitat but minimum classification for suitability would be retained. Although minimum canopy covers would be retained, this alternative would have the greatest effect on suitability of the habitat for nesting due to the number of acres thinned the level of reduction of canopy cover and layering.
      - ***Alternative C***
        - ✓ **5D to 5M:**Canopy cover would be reduced on **119**acres of suitable nesting habitat, but minimum classification for suitability would be retained. Alternative C is not as intensive as Alternative B and predominately reduces canopy along major roads and the Gibsonville Townsite.
    - Foraging Habitat (4D and 4M)
      - ***Alternative B***
        - ✓ **4D to 4M:**Suitable habitat would be reduced on **147** acres of suitable nesting habitat but minimum classification for suitability would be

retained. Although minimum canopy covers would be retained, this alternative would have the greatest effect on suitability of the habitat for foraging due to the number of acres thinned the level of reduction of canopy cover and layering.

- ✓ **4D to 4S:**Suitable habitat would fall below suitability on **21acres** within aspen units.NOTE*Only 15 acres thinned considering RCA buffers of only HCPB.

- ***Alternative C***
  - ✓ **4D to 4M:**Canopy cover would be reduced on **105**acres of suitable nesting habitat, but minimum classification for suitability would be retained. Alternative C is not as intensive as Alternative B and predominately reduces canopy along major roads and the Gibsonville Cemetery. This alternative would have the greatest effect on nesting habitat than Alternative B-Modified because more acres of 5s are reduced in canopy cover but less than Alternative B, even possibly reducing the potential for use as foraging habitat.
  - ✓ **4D to 4S:**Suitable habitat would fall below suitability on **21acres** within aspen units.NOTE* Only 15 acres thinned considering RCA buffers of only HCPB.

- **CSO PACs and Territories**
  - **PAC**

    Alternatives B and C,No Mechanical Thin treatments are proposed within PACs under Alternatives B or C. To meet IR for the owl 100 acres of alternate nesting habitat has been added to PAC SIE0046. Recently, new activity centers have been located east of Gibson Creek, Unit 610. Due to private lands to the west (mostly unsuitable), the steep and rocky Slate Creek drainage to the east, past harvesting and high level use paved road there is limited habitat for the establishment of another PAC on FS lands. The proposal would be to drop a portion of the southern end of PAC SIE0046 and add to the northern end of the PAC by extending along the east side of Gibson Creek to include the additional activity centers. Alternative B proposes VDT 40% for the 27.7 acres within Unit 610 which is where the new activity centers were located. Alternative C proposes HCPB, which keeps the option open of PAC placement to cover the new activity centers. Alternative B does not keep options open with the VDT 40% treatment, treated acres would no longer be suitable nesting habitat, and likely not even foraging.
  - **Territory**
    - Alternative B, proposes 115.7 acres of VDT 40% treatments within owl Territories. These treatments reduce suitable owl habitat to below the minimum of 50% canopy cover recommended under the CSO Interim Recommendation (IR).These treatments are mainly for economics versus fuels reduction. There are only a few RCAs within the Territories so only a few acres buffered and treated by HCPB instead of VDT40%.

      SIE0046 =27.7 acres in Unit 610.Existing canopy cover is 54%.

      = 30.0 acres in Units 557, 560 and 570. Existing canopy cover is 52%.

      = 33.0 acres in Units 551 and 555. Existing canopy cover is 74%.

PLU0192 = 25.0 acres in Units 752 and 754. Existingcanopy cover is 60%
PLU0184 = 0.0 acres
SIE0069=0.0 acres

- Alternative C,proposes HCPBand/or underburningfor all of the units above within Territoriesproposed for VDT 40% under Alternative B. Existing canopy cover would not change. The HCPB treatment would reduce fuels and improve owl habitat in the short and long-term.

- **Transportation**
  - Alternative B proposes 1.6 miles of new temporary road construction. None of the miles adversely affect a perennial or intermittent stream course. However, in order to access a proposed VDT area (Units 551-570), 1.2 miles of new temporary road would be constructed through a California spotted owl (CSO) PAC and Territory, and a Northern goshawk (NOGO) PAC. An additional 0.4 miles of temporary road would be constructed to access the Aspen stands but would not enter a CSO PAC or Territory, or a NOGO PAC.
  - Alternative C would only construct the 0.4 mile of temporary road to access the Aspen Release area.This area is within suitable habitat but not within a PAC or Territory. The impact to CSO habitat would be much less under Alternative C as compared to Alternative B.
- **Landings**
  - Alternatives B and C propose the use of 29 existing landings. None of the proposed existing landings are located in a CSO PAC and less than half are within CSO Territory. All are along established roads.
  - Alternative Bproposes10 newly constructed landings. The landing are 0.5 acres in size. Seven of the new landings would be within or adjacent to PAC SIE0046 or the Territory. (five within or edge of NOGO PAC). Three are proposed for the Aspen Release which are not within a PAC or Territory.
  - Alternative Cproposes 3 newly constructed landings. The landings are not within a CSO PAC or Territory (or NOGO PAC) and are associated with the Aspen Release (using dry meadow edge). None of the landings adversely affect a perennial or intermittent stream course.

Refer to **Tables 8 and 15** above. It is predominately the surface and ladder fuels that would be removed for mechanical thin treatments but also dominant and co-dominant trees: 1) none of the trees 0-6" dbh would be retained;2) very few of the trees 6-11" dbh would be retained; 3) only some of the trees 11-24"dbh would be retained; 4) the majority of the trees 24" dbh and greater would be retained; and 5) all trees 30" dbh or greater would be retained except for operability or safety. Refer to the Gibsonville Project - SilvicultureReport (USDA 2016c) and Fire & Fuels Report (USDA 2016d)and Terrestrial Vegetation section within this document.

Overall, treatments are intended to reduce dense ground and lower understory material, reduce tree density in the mid-story but retain the majority of the upper-story canopy cover. Although there would be short-term disturbance, removing trees between 0-6" dbh would improve habitat in the short and long-term for the owl by opening up the lower understory for flight and prey capture. Removal is never 100% so treatment still allows for cover for prey species. Removing trees between 6-11 inches would reduce the tree density in the understory. Removal and/or reduction of the ladder fuels (0-16"dbh) reduces the potential for stand replacing fires and habitat loss for a much greater period. It is not the removal of trees between1-10"dbh, even up to 16"dbh (refer to GTR 220 and 237) that are of the greatest concern for

modifying suitable habitat for the CSO. It is the removalof trees in the intermediate and dominant size classes (20 to 30 inches in diameter) that would reduce stand vertical heterogeneity (habitat layering) and mid to upper canopy cover.Regrowth of the 0-6 is expected to occur quickly due to high growing conditions but the short-term removal of the material would reduce competition for growth of medium and large trees.

The California Spotted Owl Module: 2010 Annual Report for the Plumas-Lassen Administrative Study (PLAS) area notes that "Spotted owls selected against 40% canopy cover DFPZ landscape fuelbreak thins, but not for other fuels treatments (removal of <10'dbh trees; understory thins), for nocturnal activities; we hypothesize that the habitat character of DFPZs may be unfavorable for common spotted owl prey species" and spotted owls foraged much closer to their site centers than expected by chance; because fuel treatments are not permitted within PACs" (USDA 2011). Alternative C would have less impact on suitable habitat then Alternative B. Not actively treating within CSO PACs, with the exception of allowing prescribed fire, no mechanical thin or GS treatments in goshawk PACs and Riparian Conservation Areas (RCAs) would contribute to higher tree density and vertical and horizontal diversity within larger stand treatment areas.

"Non-Mechanical Thin Treatments"

(*Hazard Tree Removal,Mastication, HCPB, UnderburnandMeadow/Riparian Restoration)*

The CWHR classifications would not change as a result of the Non-Mechanical Thin treatments such as Hazard Tree Removal, Mastication, Handcut/Pile/Burn (HCPB), Underburn and Meadow/Riparian Restoration**,**proposed under Alternatives B or C. Refer to **Table 21**. However, there are 116 acres of VDT 40% under Alternative B, which is changed to 91 acres of HCPB and 25 acres of no treatment under Alternative C. The main objective of the non-mechanical thin treatments is to reduce the dense surface and ladder fuels thereby reducing the chance for wildfire, reducing competition and nutrients for trees and increasing surface water for flow into creeks, and retaining habitat characteristics. Refer to the Terrestrial Habitat discussion above. Refer to the Design Feature section above, these measures are proposed to avoid or limit effects and apply to non-mechanical thin treatments (see **Table 3** above).For example, LOPs would be applied for all activities within ½ mile of activity center unless surveys,the year of the activity, document non-nesting.

Table 21. Proposed Non-Mechanical Thin treatments and acres within owl PACs and Territories.

TREATMENTS	Alternative B				Alternative C	
	Total	PAC	Territory	Total	PAC	Territory
Roadside Hazard Tree Removal	**70.6**	0.5	70.1	**70.6**	0.5	70.1
Mastication	**140.1**	58.0	82.1	**140.1**	58.0	82.1
Meadow/Riparian Restoration	**6**	6.0	0	**6**	6.0	0
Handcut/Handpile& Burn Piles	**244.3**	81.0	163.3	**401.2**	153.0	248.2
No Treatment	**83.8**	0.0	83.8	**107.1**	0.0	107.1

Under the action alternatives, the Mastication, HCPB and UB treatments would remove surface and ladder fuels up to 10"dbh. Overstory canopy cover would not be reduced and layering would be retained. There could be a short-term disturbance for owls utilizing the area for foraging. The California Spotted Owl Module: 2010 Annual Report for the Plumas-Lassen Administrative Study (PLAS) area notes that "**Spotted owls selected against DFPZ landscape fuelbreak thins, butnot for other fuels treatments (removal of <10'dbh trees;** understory thins), for nocturnal activities (USDA 2011).

These treatments would be removing surface fuels (ground fuels, shrubs and small trees) which could have some short-term effects on prey species but would benefit habitat in the long-term. These treatments are designed to retain large pieces of down wood and maintain adequate ground cover to reduce erosion and sedimentation into streams. The retention of snags and large down wood (see discussion above) would also aid in minimizing effects on the spotted owl foraging habitat and their prey species. The reduction of shrub cover may increase the availability of prey species to owls. However, it could also result in a reduction of prey species due to the loss of cover. The prescriptions within the RCAs are more restrictive (refer to Design Features above (**Table 3**)Gibsonville Project – Aquatic BEBA 2016 (USDA 2016b) and Hydrology Report 2016(USDA 2016a) and would remove some of the dense ground cover by removing surface fuels. Limited operating periods would be applied to any nesting or roosting owls. Proposed treatments would result in a short-term disturbance to species within the area due to temporary road reconstruction for mastication, activities to remove vegetation and increased road use.

Roadside Hazard Tree Removal: The 115 acresproposed for hazard tree removal also includesHCPB. Of the 115 acres proposed, 0.5 acres are within a PAC and 70.1 acres are within a Territory under Alternatives B and C. The CWHR classification would not change as a result of the treatment. The actual hazard tree removal would be within 200 feet, either side, of identified roads. Handcut/pile/burn could be within the whole unit. There is an Equipment Exclusion Zone of 150 ft for perennial streams and 82 for intermittent streams, however, hazard trees may be felled and left within these zones. No temporary roads are proposed for access.Unit 565 borders a PAC and would have a LOP unless surveys determine non-breeding within 0.25 miles of the unit.

Mastication: There are total of 181 acres proposed for mastication of material up to 10"dbh. Of the 181 acres, 58 acres are within a PAC and 82.1 acres are within a Territory under Alternatives B and C. There is an Equipment Exclusion Zone of 82 ft for perennial streams and intermittent streams. About 55 acres of Unit 2, is within a PAC and would have a LOP unless surveys determine non-breeding. About a 0.25 miles overgrown temporary road is proposed for access to the unit. This road is within a PAC and would be effectively close upon mastication and HCP activities. Treatments within the Territory and would use existing roads for access.

HCPB: The major difference between action alternatives B and C is that 116 acres proposed for VDT 40% under Alternative B are proposed for HCPB or no treatment under Alternative C. These 116 acres are within designated Territories. Alternative C would have less of an affect than Alternative B because it retains and improves habitat with in owl territories. Alternative B: there are total of 345 acres proposed for HCPB, of these acres, 81 acres are within a PAC and 163.3 acres are within a Territory. Alternative C: there are total of 435 acres proposed for HCPB, of these acres, 153 acres are within a PAC and 248.2 acres are within a Territory. Units 1, 559 and 569, which are in a PAC, would have a LOP unless surveys determine non-breeding.

Underburn:Underburning is a secondary treatment for VDT 40%, HCPB and mastication treatments. Underburns have Design Feature requirements, see **Table 3** above. Units 1, 559 and 569 (HCPB under Alternative B and C) and 610 (VDT40% under Alternative B and HCPB under Alternative C) would have a LOP unless surveys determine non-breeding. Underburns would be lit outside of RCAs, allowing fires to backburn into riparian habitat. Prescribed light underburns leave a mosaic of burned and unburned areas, so some shrubs would remain to provide cover for prey species using these areas. Smoke inhalation can kill or affect the health of owls. However, not all acres will be burned at once and adult owls can fly away from burning areas, especially small areas.

Meadow/riparian restoration: There are 25 acres proposed for meadow/riparian restoration. This work will be conducted by hand and could remove trees up to 16" dbh. The objective is to remove encroaching

conifers within and along the edge of meadows.Design Features are required, see **Table 3**, to protect aquatic features. Six of the 25 acres are within a CSO PAC but none are within a Territory. The meadow, R01, is on the edge of PAC SIE046 and would require a LOP unless surveys determine non-breeding.

CUMULATIVE EFFCETS: For both action alternatives, direct effects are not expected and indirect effects are expected to be low.

***Wildfires and Fuels Treatments*:** Fuels reduction treatments are implemented primarily to reduce the surface (0-6"dbh) and ladder (10-16" dbh) fuels which if left in dense conditions could lead to catastrophic wildfires. These wildfires could pose a threat to California spotted owl habitat. Large scale changes in owl habitat as a result of past wildfires and anticipated future fires in spotted owl habitat has been identified as a potential threat affecting spotted owl distribution {Federal Register, Vol. 70, June 2005 (USDI 2005) and Vol. 71, April 2006 (USDI 2006)}. Habitat effects from wildfires cannotbe fully measured immediately following wildfire, because direct and indirect tree mortality may not become evident for several years. It is unknown, therefore, how much burning of PACs resulted in sufficient loss of live mature trees and changed stand structure to eliminate or significantly diminish habitat suitability for spotted owls.

Excerpt from the *"*California Spotted Owl Module: 2010 Annual Report*"*:A primary source of uncertainty regarding the effect of fuels treatments is an assessment of risk to the CSOs and their habitat from treatments versus the risk from wildfire that occurs across untreated landscapes. Results of 2 years of survey work for the Moonlight-Antelope Complex Wildfires, primarily high-severity, suggest that the primarily high-severity wildfire does not support CSOs other than a single pair that is using the landscape. First year results of the Cub-Onion Complex wildfire, primarily low-moderate severity) suggests that CSOs were able to persist in the post-fire landscape with similar abundance and spacing as has been observed in unburned forests outside the burned areas. It is important to determine both the acute and chronic responses of CSOs and their habitat to wildfires as it is unknown if CSOs can persist over both the short-term and long-term in these areas (USDA 2011).

The following are recent publication regarding wildfire and the Spotted Owl and/or their habitat:

Researchers from Oregon State University found Northern Spotted owls avoid areas that have been clear cut but will use burned areas of low, moderate and high severity for roosting and foraging (Clark 2007 et al.). Results from past studies of owls in burned areas can be unclear. Fires with high severity seemed to adversely affect occupancy in some owl territories while in other territories affected by the same fire severity do not affect occupancy and the owls remain and continued to reproduce (Bond et al. 2002, Jenness et al 2004). It is hypothesized that fire could increase prey abundance, and access to prey by creating patchy openings (Franklin et al. 2000).

"Occupancy of California Spotted Owl sites following a large fire in the Sierra Nevada, California" (Lee and Bond 2015)found that the amount of high-severity fire in the PAC did not affect pair occupancy. California Spotted Owls continue to use post-fire landscapes, even when the fires were large and where large areas burned at high-severity, suggesting that owls are not generally negatively impacted by high-severity fire. Based on this and other studies of Spotted Owls, fire, and logging, we suggest land managers consider burned forest within and surrounding PACs as potentially suitable CSO foraging habitat when planning and implementing management activities, and we recommend against logging burned forest within 1.5 km of nests or roost core for the conservation and recovery of this declining species. Recognize fire as a natural rejuvenating process of Sierra Nevada forests (DellaSalla et al 2014) and to no longer assume burned forest is unsuitable CSO habitat when planning and implementing

management activities in PACs and Home Range Core Areas (HRCAs)". Much of the information used for this study was from surveys conducted by the USFS in the Rim Fire during 2014 breeding season.

"Megafires: an emerging threat to old-forest species" (Jones et al 2016).Increasingly frequent "megafires" in North America's dry forests have prompted proposals to restore Historical fire regimes and ecosystem resilience. Restoration efforts that reduce tree densities (eg via logging) could have collateral impacts on declining old-forest species, but whether these risks outweigh the potential effects of large, severe fires remains uncertain. We demonstrate the effects of a 2014 California megafire on an iconic old-forest species, the spotted owl (Strixoccidentalis). The probability of owl site extirpation was seven times higher after the fire (0.88) than before the fire (0.12) at severely burned sites, contributing to the greatest annual population decline observed during our 23-year study. The fire also rendered large areas of forest unsuitable for owl foraging one year post-fire. Our study suggests that megafires pose a threat to old-forest species, and we conclude that restoring historical fire regimes could benefit both old-forest species and the dry forest ecosystems they inhabit in this era of climate change.

"The Heat Is On: Spotted Owls and Wildfire" (2016 M.L. Bond). Wildfires are the primary natural disturbance in western forests of the United States, and native plants and animals have been living with fire for thousands of years of their evolutionary history. Forest fires typically burn in a mosaic of different severities. "Highseverity" fire kills most or all of the dominant vegetation in a stand and creates what scientists have termed "complex early seral forests," where standing dead trees, fallen logs, resprouting shrubs, tree seedlings, and herbaceous plants comprise the structure (Swanson et al., 2011; DellaSala et al., 2014). Complex early seral forests differ from postfire harvested forests in that dead trees remain on-site, providing food sources and shelter for numerous wildlife species (Hutto, 2006; Swanson et al., 2011; DellaSala et al., 2014). Wildlife responses to wildfire are complex, because fire itself burns in complex patterns. Responses are influenced by such factors as time since fire, fire severity, size of burned patches, previous disturbance history, amount and configuration of different prefire habitat types, and postfire management activities like harvesting timber and spraying herbicides. Studies that incorporate these covariates can better elucidate the complexity of wildlife responses to high-severity fire and generate results that areinformative for wildlife management and conservation. In this article, I explore the relationship between high-severity wildfire and a species associated with late-successional forests of the Western United States, the spotted owl (*Strixoccidentalis*). Current recovery efforts for this threatened species assume wildfire is a primary threat, and therefore, widespread timber harvest for "fuel reduction" (ie, thinning) is needed to reduce fire severity in dry forests occupied by the spotted owl. However, such recommendations are misguided, as explained in the succeeding text.

Based on the information presented in the above publications, I expect that a large high-intensity wildfire with little remaining green forest is less like to be usable by spotted owls versus a large high-intensity wildfire with patchy amounts of suitable habitat remaining. Question is, how much suitable habitat, and at what quality, has to remain in order for it to be usable by owls. Another point made it that an unlogged burned area is more likely to be suitable than a logged burned area.

In 1999 there was the Devel's Gap Fire which was about 1500 acres and burned at 90% high-intensity and was about 10 mile southwest of Gibsonville area. Multiple smaller fires have occurred throughout the analysis area, small fires either ignited by lightning and human caused means that were contained and controlled during the initial attack phase. Refer to the Gibsonville Fire & Fuels Report 2106. There has not been any recent large high-intensity wildfires in the analysis area. However, due to climate change and drying conditions the possibility of a large high-intensity fires is of concern aggravated by the lack of natural fire in the area due to suppression.

***Barred Owl*:** The U.S. Fish and Wildlife Service concluded that barred owls constitute a threat to site occupancy, reproduction and survival of the California spotted owl, but that there currently is not enough information to conclude that hybridization with barred owls poses a threat (Federal Register, vol. 70, 35613, June 21, 2005).

The *"*California Spotted Owl Module: 2010 Annual Report*"*states: "Barred and sparred owl detections were the highest during 2010 surveys within the Plumas-Lassen Study area thenany that were detected in any year during the study from 2003-2010. The pattern of records suggest that barred/sparred owls have been increasing in the northern Sierra Nevada from 1989-2010 and are now present in low, stable numbers over the 4-5 years on our study area. Results indicate that barred owls are increasing in the northern Sierra Nevada and may become an increasing risk factor to CSOs."

The potential for the barred owl to become established and compete with California spotted owls within the Gibsonville Project area is a possible additional cumulative effect, but at this point, it is unknown as to what the extent this effect will be. The Gibsonville area lies between a heavier treated private land and unsuitable steep, rocky Slate Creek drainages which could make the area more desirable to the barred owl. To date barred owls have not been located in the Gibsonville area which is in the northernmost portion of the Slate Creek watershed, however, there are a number of barred and sparred (Ca. spotted owls mated to Barred owls) owl in the lower to middle of the watershed.

***Plumas-Lassen Administrative Study*:** "California Spotted Owl Module: 2010 Annual Report" (USDA 2011): 1) The Lassen Demographic Study results suggest a decline in the CSO population within the Lassen study area over a 20-year study period; 2) The Plumas NF Survey Areas crude density estimates within individual Survey Areas indicate similar densities and number of territorial single sites) between 2004-2010 for the survey areas on the Plumas NF; 3) California spotted owls selected against DFPZs, but not other fuel treatments (group selection), for nocturnal activities: hypothesized that the habitat character of DFPZs may be unfavorable for common spotted owl prey species. Spotted owls foraged much closer to their site center than expected by chance; because fuels treatments are not permitted within PACs. One owl strongly selected underburn treatments over untreated forest for foraging; limited availability of underburn within the study are prevents further extrapolation of the result: 4) Overall, about 90% of the 103 CSO territorial sites were located within CWHR 4M, 4D,5M,5D and 6 size classes. The remaining 10% of sites were located in more open, smaller-tree size polygons, with nests or roosts located within remnant, scattered larger trees.

***Demographic Studies*:**Four demographic studies of California Spotted Owl have been ongoing for a number of years within the Sierra Nevada: (1) Eldorado National Forest (since 1986); (2) Lassen National Forest (since 1990); (3) Sierra National Forest (since 1990); and (4) Sequoia-Kings Canyon National Park (since 1990). One of the primary objectives of these demographic studies is to monitor rate of change (lambda, λ) in owl populations (i.e., the number of owls present in a given year divided by the number of owls present the year before)(Franklin et al. 2004, Blakesley et al. 2010). Although researchers update demographic estimates for individual study sites annually in unpublished reports, the most recent meta-analysis of data from all four study sites in the Sierra Nevada (Blakesley et al. 2010) provides the most robust demographic estimates available. For the Eldorado NF and Sierra NF, and the Sequoia-Kings Canyon study areas the owl populations were stable, with adult survival rate highest for the Sequoia-Kings Canyon National Park. The Lassen study area shows a steady annual decline of 2-3 percent in the study population between 1990 and 2005. Recent demographic modeling efforts in central and northern Sierra Nevada reported similar lambda estimates (Conner et al 2013, Table 2; Tempel et al. 2014, Figure 3) to those summarized in the most recent meta-analysis (Blakesley et al. 2010). WILDCATrefs

***Uncertainty*:**Potential effects from the proposed mechanical thin treatments are the reduction in the quality and quantity of suitable habitat outside of designated PACs and Territories. The key uncertainties related to viability in the Sierra Nevada include (1) factors driving population trends; (2) habitat relationships and habitat quality; (3) current distribution, amount, and quality of habitat; (4) treatment effects, including fuels and silvicultural treatments, on habitat and populations at multiple scales; and (5) increase in barred/sparred owl detections. There is a degree of uncertainty as to risk of potential wildfire and disease if treatments were implemented to a lesser degree, thereby retaining habitat that is more suitable in terms of canopy cover and layering.

8.10Northern Goshawk

Affected Environment

Suitable Northern goshawk (NOGO) nesting habitat consists of CWHR classes 5D, 5M, 4D and 4M in Sierra Mixed Conifer, White Fir and Montane hardwoods. Suitable NOGO foraging habitat consists of CWHR classes 3M, 3D, 4P, 5P and 6 in Sierra Mixed Conifer, True Fir and Montane hardwoods. The CWHR estimates are based on the most recent vegetation data available for Gibsonville, which is from aerial photo interpretation and Plumas National Forest "e-veg" timber type coverage's (based on 1997 aerial photographs) in the Geographic Information System (GIS). The photographs were used to determine timber strata, CWHR size, and densities. The GIS coverage was also used to determine land classifications and allocation.

There is habitat within the Gibsonville analysis area including the treatment units that is suitable for goshawks to nest and forage. Of the**3,952 acres** analysis area, FS land only, there are **2,938 acres** CWHR classified as suitable habitat: 2,364 acres as suitable nesting habitat (5M, 5D, 4M, 4D) and 574acres as suitable foraging habitat (3M, 3D, 4P, 5P and 6). Refer to **Tables 8 and 9** above. There is also approximately 1,014acresof unsuitable habitat within the analysis area, predominately due to steep and rocky Slate Creek drainages. Stand typing changes when looking at aerial photographs and Google Earth images, as compared to just looking at the forest CWHR typing.

Within the 3,952 acre wildlife analysis area there are three NOGO PACs associated with the analysis area: T55 (Wallace Creek), T58 (Delahunty Lake) and T70 (Bellvue Sears). However only two NOGO PACs, T55 and T58 are affected by the proposed project. These two NOGO PACs are completely within the analysis area and have proposed non-thinning treatments such as mastication and HCPB. Not all of the acres that are within the PACs are typed as suitable for nesting. The PACs were placed to include all of the activity centers associated with the PAC while considering suitable habitat and topography. Refer to **Figure 8** which shows the location of the PACs and the proposed treatments.

Environmental Consequences

No Action Alternative (Alternative A)

DIRECT and INDIRECT EFFECTS: There would be no direct effects on the Northern goshawk or its habitat, as no activities would occur that would cause disturbance to nesting or foraging birds, nor any impacts to the existing habitat conditions.Indirect effects of no action include the potential for future wildfire and its impact on habitat development and recovery. The fuel loads that would be left by this alternative would make potential wildfires in the area difficult to suppress and create a more intense burn, which could lead to increased rates of spread resulting in potential loss of suitable goshawk nesting habitat and other important prey habitat attributes such as large trees, large snags and down woody material.

CUMULATIVE EFFECTS: The No Action Alternative for the Gibsonville Project would not provide for the long-term protection of goshawk habitat from wildfire. There would be no actions designed to reduce the risk of high intensity wildfire. Total wildfire acres and high intensity wildfire acres are anticipated to increase from current levels under this alternative (based on analysis conducted in SNFPA (2001 and 2004). There would be no thinning that could enhance the growth of dominant and co-dominant trees that may provide future habitat availability.

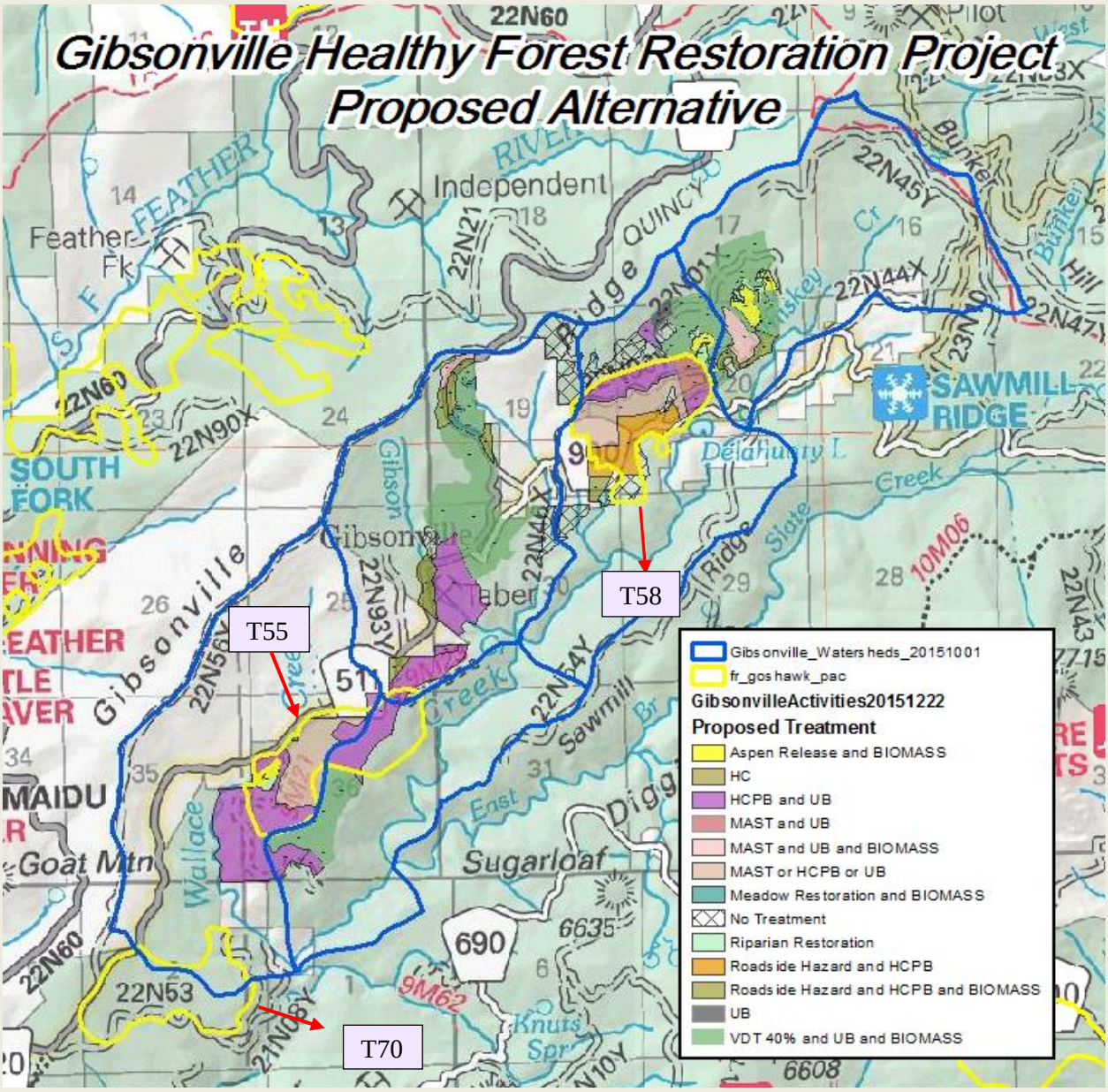

Figure 8. Location of Northern goshawk Protected Activity Centers (PACs) in relationship to proposed Gibsonville treatments.

Action Alternatives: Alternatives B and C

DIRECT and INDIRECT EFFECTS: Direct effects are not expected and indirect effects are expected to be low for the Northern Goshawk and it's habitat based onfollowing direction, standard and guidelines, design featuresand protection measures:

AlternativesB and C

- Protocol level surveys were conducted in 2014 and 2015 within the analysis area.
- Known activity centers were field checked in 2016 for activity.
- If new activity centers are located, PACs would be adjusted to include the activity centers or a new NOGO PAC created.
- NOGOPACs have been established to encompass all known activity centers.
- No mechanical thin treatments are proposed in NOGO PACs.
- Fuels reduction treatments, by mastication and HCPB, are proposed within NOGO PACs.
- Design features such as Limited Operating Periods (LOPs), would be in place to prevent disturbances to nesting goshawks located in or within ¼ mile of treatments (harvest, road construction, log hauling, etc.).
- The proposed fuels reduction treatments would improve habitat for nesting or foraging outside of NOGO PACs.
- Large Trees: trees 30 inches dbh and greater would be retained, except for operability and safety.
- Snags: 4-6 snags per acre, 15 inches dbh or greater would be retained, where feasible.
- LDW: 10-15 tons per acres of large down logs would be retained, where available, and no YUM.

Alternative C

- Alternative C: 116 fewer acres of Mechanical Thin.
- Alternative C: No new landings or road construction are proposed in NOGO PACs

"Mechanical Thin Treatments"
(Variable Density Thin and Aspen Release)

- **Suitable Northern Goshawk Habitat**
    - Nesting Habitat(5D,5M,4D,4M)

    Refer to the "Suitable CSO Habitat" discussion above and **Tables 8 and 9,** for the affects to 5D,5M and 4D,4M habitat. The discussion would be similar for the Northern goshawk. Northern goshawks use 4D and 4M stands for nesting as well as the 5D and 5M used for nesting by the CSO.

    Of the **2,364 acres** of suitable habitat within the analysis area: habitat is reduced to minimal suitability on **294acres** under Alternative B and **224acres** under Alternative C. The CWHR size class of 4 and 5 is retained but density is reduced from D to M (minimum of 40%). Although past monitoring of habitat taken to 40% canopy cover has shown that it is not even selected for foraging by owls it is selected for foraging by the Northern goshawk. Also, habitat is reduced to below suitability,from a 4D to 4S, on 21 acres for aspen release.

    Alternative B would have a greater impact on NOGO habitat as a result of the number of acres with a VDT 40% treatment. Alternative C would reduce habitat as a result of the VDT 40%

surrounding the aspen stands but minimum suitability would be retained for nesting and habitat would be improved for foraging.

Alternative B assumes a larger risk then Alternative C, because the alternative proposes todecreaseand remove suitable NOGO nesting and foraging habitat (outside of PACs) and could reduce the use of the treated areas at least for the short-term. However, the proposed action is intended to reduce the long-term risk of the loss of habitat due to fire and disease. Refer to Gibsonville Project Fire & Fuels (USDA 2016d) and Silviculture Reports, 2016(USDA 2016c). Minimum levels of the direction, and standards and guidelines in the SNFPA ROD 2004, would be met.

A major difference between the CSO and the NOGO is that the Northern goshawks will utilize a more open understory for foraging so treatments,outside of NOGO PACs, may benefit this species in the long-term.

- Foraging Habitat (3M, 3D, 4P, 5P)

Of the **574 acres** of suitable foraging habitat within the analysis area: under Alternative Band C there are **85 acres** of 3D that could be reduced to 3M: 46 acres by VDT 40% and 39 acres by HCPB. The 39 acres of HCPB are already at the lowest density for a "D" stand and therefore it doesn't take much to reduce it to an "M" stand. The 46 acres of VDT 40% may stay at a 3D due to the patchiness of the thinning. This habitat is outside of any PACs, but adjacent to PAC T55.The 85 acres would be still considered suitable for foraging at minimal levels.

- **Protected Activity Centers (PACs)**
  - **Mechanical Thinning**: No mechanical thinning is proposed within NOGO PACs.
  - **Roads**
    - T55: Alternative B = 0.5 miles of temporary road construction (reconstruction of 0.3 miles of existing and new construction of 0.2 miles)

Alternative C = 0 miles

    - T58: Alternative B and C = 0 miles
  - **Landings**
    - T55: Alternative B = 3 new landings within and 2 new landings on edgeof PAC.

Alternative C = no new landings

    - T58: Alternative B and C = 4 existing along road within NOGO PAC

"Non-Mechanical Thin Treatments"

(*Mastication, HCPB, Underburn, Meadow/Riparian Restorationand Roadside Hazard Tree Removal)*

There is a difference on NOGO habitat between Alternatives B and C. There are 116 acres of VDT 40% under Alternative B, which is changed to 91 acres of HCPB and 25 acres of no treatment under Alternative C. Therefore, 116 fewer acres of suitable habitat would be reduced under Alternative C. Overall the CWHR classifications would not change as a result of the Non-Mechanical Thin treatments proposed under Alternatives B or C. The fuelstreatments such as Mastication, HCPB, Underburn and would remove surface and ladder fuels up to 9.9 inch dbh while retaining upper and midstory canopy cover. This could have some short-term effects on prey species and disturbance to goshawks but would benefit goshawk habitat in the long-term. The Meadow/Riparian Restorationwould take a few more trees up to 16" dbh but this would be limited to within or on the very edge of meadows. These trees would be hand-felled. The Roadside Hazard Tree Removal, which is removing hazard trees within 200 feet of the road, is not expected to change the overall CWHR typing for the stands.

These changed acres are not within a NOGO PAC. The main objective of the non-mechanical thin treatments is to reduce the dense surface and ladder fuels thereby reducing the chance for wildfire, reducing competition and nutrients for trees and increasing surface water for flow into creeks, and retaining habitat characteristics. Refer to the Terrestrial Habitat discussion above. Refer to the Design Feature section above, these measures are proposed to avoid or limit effects and apply to non-mechanical thin treatments (see **Table 3** above). For example, LOPs would be applied for all activities within ½ mile of activity center unless surveys, the year of the activity, document non-nesting.

- **Protected Activity Centers (PACs)**
  Treatments are the same for NOGO PACs under Alternatives B and C.Of the 1,200 acres proposed for non-mechanical treatment, 346 acres would be within NOGO PACs. Of the 346 acres there are: 143 of HCPB and UB, 148 acres of Mastication or HCPB or UB, 47 acres of Roadside Hazard Tree Removal and HCPB, and 4 acres of riparian restoration. Activities will have a LOP of no activity between March 1st and September 15 unless surveys are conducted before project implementation and no breeding is documented (refer to Design Features above). These treatments would improve habitat conditions within the PACs and reduce fuels which could lead to wildfires and habitat loss.

CUMULATIVE EFFCETS: Direct effects are not expected and indirect effects are likely to be very low. Cumulative effects from the Gibsonville Project for the Northern goshawk are expected to be minimal when added to other actions. Based on not entering goshawk PACs, surveys, protection measures, project design featuresand retaining suitable habitat the impact to the Northern goshawk is expected to be very low.

Cumulative effects on the goshawk could occur with the incremental loss of the quality of habitat for this species. Overall, increases in recreational use of National Forest lands, and the use of natural resources on state, private, and federal lands, may contribute to habitat loss for this species. High-intensity stand-replacing fires, and the means by which land managers control them, have contributed and may continue to contribute to loss of habitat for this species.

The analysis of cumulative actions focuses on past timber sales as they related to impacts on suitable owl habitat, more specifically CWHR size 4M, 4D, 5M, and 5D. These same CWHR types are considered suitable goshawk nesting habitat. Generally, the average tree size in the nest stands found on the project ranged from 25 to 40 inches. That translates to CWHR size 4 and 5. Through analysis, all of these actions often translated into a projected decrease in habitat suitability for goshawks.

It is uncertain as to what influence this reduction in habitat would do to goshawk activity and occupancy in the wildlife analysis area, but it is not anticipated that the cumulative habitat reduction would result in loss of occupancy and productivity of known goshawk PACs. This is based on the location of project activities in relation to known PACs, no habitat alteration in PACs, and distribution of known PACs.

8.6Pacific Marten

Affected Environment

The analysis area, elevations between 4,900 to 6,400, is within the range for the Pacific Marten. The area is at the very low elevational range for the marten (5,000-10,000').The following CWHR types are important to marten: generally structure classes 4D, 4M, 5D, 5M and 6 in ponderosa pine, montane hardwood-conifer, mixed conifer, montane riparian, aspen, red fir, Jeffrey pine, lodgepole pine, subalpine conifer, and eastside pine.

The physical structure of the forest and the prey associated with forest structures are thought to be the critical features that explain marten habitat use. Powell 1994 (in Federal Register 2004) states that forest type is probably not as important as the vegetative and structural aspects, and marten may select forests that have low and closed canopies. Numerous studies (as referenced in the 2004 SNFPA FSEIS) indicate that canopy closure over 60 percent is important, and marten preferentially select home ranges to include high proportions of dense forested habitat.

Marten select stands with continuous canopy cover to provide security cover from predators. The dense canopy increases snow interception, lowers the energetic costs of traveling between foraging sites, and preferred prey species may be more abundant and vulnerable in areas of higher canopy closure (ibid.). A number of studies have shown that the marten avoid areas with little forest cover r significant human disturbance and prefers large areas of contiguous interior forest (ibid.).

Marten utilize large diameter trees and snags as above ground rest (den) structures (Gilbert et al. 1997) and (Raphael and Jones 1997). Martens show a higher use of fires than other tree species when using live and snags as rest (den) structures (Spencer 1987). Marten seek larger live trees and snags than those generally available. Availability of these larger trees, snags and downed logs, frequently associated with older forests, are essential components for functional habitat for martens (Payer and Harrison 1999). These findings were similar in the Lassen National Forest, Pacific Marten Rest Site Use, Progress Report 2011.

The potential direct effects on marten from vegetation management activities consist of modification of habitat or habitat components, in regards to denning/resting habitat and foraging/travel habitat. There are no known den sites in the analysis area. However, there is suitable habitat within the project area and the lack of detections as a result of surveys does not mean species absence. If a marten den site is found in the future, the site will be protected and a LOP would be implemented within ½ mile of the den site (2004 SNFPA FSEIS/ROD). Although surveys were conducted to protocols, the marten are very elusive species and are not as easily detected as the CSO or goshawk. In addition, there are no land allocations such as there are for the CSO and goshawk with PAC land allocations. Therefore, direct effects are based on the loss, modification or fragmentation of suitable habitat, especially drainages and midslopes, and habitat components. Whereas, indirect effects are road density and new temporary road construction, and disturbances such as equipment noise as a result of the activity.

The wildlife analysis area for the marten is **3,952 acres**, FS only. There are **2,364** acres classified as suitable habitat: 1,514 acres as suitable denning and resting habitat (6, 5D and 4D) and 850acres as suitable foraging and travel habitat (5M and 4M). Based on CWHR classification, there is moderate to high suitable denning/resting and foraging/travel habitat throughout the analysis are, including the proposed treatment units. There are historical detections of marten within the analysis and treatment area. However, no den sites have been located.

The Gibsonville area is at the lower end of the elevational range for the marten and the area has limited habitat for movement within the best-cost corridor identified for the marten because of the amount of land unsuitable (water,rock,etc.). Also there is a lot of private land within the corridor which is used for timber production by the timber industry or private landowners. The marten are most likely utilizing the mid-slopes and riparian zones but could also utilize the smaller ridges to crossover between subwatersheds. The analysis area is around the headwaters of the South Fork Feather River system. Riparian zones are used for denning, resting, foraging and as movement corridors. Protocol level surveys conducted in 2001 and 2002 for the Bald Mountain Project, which is directly west of the Gibsonville area, resulted in no new detections. The FS wildlife crew installed four cameras during February-March 2011 around the LGVR area for the Grass Valley Project, which is west of the Gibsonville area, and no marten were detected.

However, due to multiple heavy snow events, access was very limited; in some cases cameras were buried and were checked infrequently. These surveys did not follow formal protocols.

Environmental Consequences

No Action Alternative (Alternative A)

Habitat connectivity is a key to maintaining marten within a landscape. Avoidance of open areas may restrict movement between habitat patches and decrease colonization of unoccupied yet suitable habitat. The highest likelihood of conserving populations is management of areas large enough to include many contiguous home ranges. The No Action alternative would not increase any large scale, high contrast fragmentation above existing level.

DIRECT and INDIRECTEFFECTS: There would be no direct effects on the marten. No activities would occur that would cause disturbance to known denning or resting sites and no detections have been made in the analysis area. If present, based on elevation it is more likely the marten than the fisher would be affected by reduction in canopy cover and stand layering. Marten could be disturbed if denning, resting, foraging or traveling through the area.

Indirect effects of no action include the potential for future wildfire and its impact on habitat development and recovery. The fuel loads that would be left by this alternative would make potential wildfires in the area difficult to suppress and create a more intense burn, which could lead to increased rates of spread resulting in potential loss of suitable forest carnivore habitat and other important prey habitat attributes such as large trees, large snags and large down wood. However, there is an uncertainty as to how adverse a wildfire would be since they historically occurred naturally versus todays' more un-natural fuels situation due to fire suppression.

CUMULATIVE EFFCETS: The "No Action" alternative for the Gibsonville Project would not provide for the long-term protection of forest carnivore habitat from wildfire. There would be no actions designed to reduce the risk of high intensity wildfire (refer to GibsonvilleProject – Fire&Fuels Report 2016). Total wildfire acres and high intensity wildfire acres are anticipated to increase from current levels under this alternative (based on analysis conducted in SNFPA (USDA 2001).

Action Alternatives: Alternatives B and C

DIRECT and INDIRECT EFFECTS: Under Alternative C, direct and indirect effects are expected to be very low in the short-term and beneficial in the long-term formarten. Under Alternative B. direct and indirect effects are expected to be low-moderate on marten habitat. This is based on following direction, standard and guidelines, protection measures and design features:

Alternatives B and C

- there are no known den/rest sites in the analysis area;
- protocol level surveys were conducted within the analysis area in 2001-2002 for the Bald Mountain Project and target surveys in 2011 for the Grass Valley Project;
- protection measures such as LOPs are included to protect any den or rest sites if they are located;
- many acres of suitable mature/older forest habitat will be avoided because there will be no mechanical thin treatments within CSO PACs and NOGO PACs;
- overall, treatments are not entering RHCAs except for understory burning and HCPB, retaining riparian vegetation;
- any treatments within riparian areas would be to maintain or restore habitat.

- almost half of the mechanical thin treatments which reduce canopy cover are along access roads which are not optimum for marten habitat due to higher levels of disturbance or along ridge-tops which are not considered preferred habitat.
- Large Trees: trees 30 inches dbh and greater would be retained, except for operability and safety.
- Snags: 4-6 snags per acre, 15 inches dbh or greater would be retained, where feasible.
- LDW: 10-15 tons per acres of large down logs would be retained, where available, and no YUM.

Alternative C

- Alternative C:116 fewer acres of Mechanical Thin.
- Alternative C: fewer new landings andtemporary road construction is proposed.

Refer to**Tables 3-19**andDesign Features section, including **Table 3** above. Project treatments, outside of mechanical thin, are expected to improve habitat conditions for the long-term. The 2004 SNFPA ROD identifies higher than average canopy closure as habitat attributes important to the marten, stating a minimum of 40 percent canopy cover needed. Forest carnivores primarily travel and forage along rivers and streams, whereas they den and forage within mature/old forest habitat. The mature/old forest blocks are predominately encompassed by CSO PACs and the NOGO PACs within Gibsonville analysis area. In addition, riparian zones, used as travel corridors, in general would be maintained or improved.

The effects are mainly short-term in nature. Size class 4 trees stands that are thinned would grow into size class 5 stands. Size class 5 stands are retaining at least the minimum level of suitability. It is predominately the surface fuels that would be removed: 1) none of the trees 0-6" dbh would be retained; and 2) very few of the trees 6-11" dbh would be retained. Some of the understory canopy cover of size class 4 (trees 11-24"dbh) would be retained. The overstory would be retained 1) the size class trees 24-30" dbh would actually increase; and the 30" and greater trees would only decrease slightly.

"Mechanical Thin"
(VDT40% and Aspen Release)

Of the 2,364 acres of suitable marten habitat within the analysis area, denning/restinghabitat would be retained but reduced to minimum suitability on **294**acres (**12.4%**) under Alternative B and **178** acres (**7.5%**) under Alternative C. All action alternatives reduce some level of suitable habitat. However, the additional 116 acres mechanically thinned to 40% under Alternative B would have a much greater impact on marten thenAlternative C. Alternative C reduces fewer acres of suitable habitat thereby retaining higher canopy covers. The VDT40% has a greater effect on the Marten then the CSO because they are dependent on density and all of the VDT40% units are D stands, suitable for denning/resting,which are reduced to minimal level M stands, barely functioning as suitable for foraging and travel.

<u>Denning/Resting Habitat (5D and 4D)</u>

The major difference between action alternatives is the number of 5D/4D acres thinned and the percent canopy cover reduction. Alternative B thins the most acres of 5D/4D stands and has the greatest overall percent canopy cover reduction. Alternative C thins the fewer acres and retains the highest percent canopy cover. ***Although the total number of acres reduced would be less with established RCAs (equipment exclusion zones).

- ***Alternative B***
  - 294 acres of 5D/4D: canopy cover reduced to 40%, reclassified as 5M/4M
  - 21 acres of 4D: canopy cover reduced to 15%, reclassified as 4S
- ***Alternative C***
  - 178 acres of 5D/4D: canopy cover reduced to 40%, reclassified as 5M/4M

- 21 acres of 4D: canopy cover reduced to 15%, reclassified as 4S

Foraging/Travel Habitat (5M and 4M)

The major difference between action alternatives is the number of 5D/4D acres thinned to 5M/4M. Alternative B thins an additional 116 acres,as compared to Alternative C, down to 40% which changes the density from a D to M. So the 5M/4M increases by 116 acres. See 5D/4D discussion above.

"Non-Mechanical"
(HCPB, Mastication, Underburn and Hazard Tree Removal)

Handcut/Handpile/Burn, Mastication and Underburntreatments would be removing surface and some ladder, fuels up to 9.9 inches dbh.Overall canopy covers and layers would not be reduced.There could be a short-term disturbance for any marten utilizing the area for denning or resting. Alternative C treats, 116 acres of 5D/4D proposed for VDT40% under Alternative B, to 91 acres of HCPB and 25 acres of no treatment. The disturbance would be much less for non-mechanical and no treatment then it would be for mechanical thin treatments.

Denning/Resting Habitat (5D and 4D)

- ***Alternative B*:**proposes to treat 417 acres
- ***Alternative C*:**proposes to treat 508 acres

Foraging/Travel Habitat (5M and 4M)

- ***Alternative B*:**proposes to treat 136 acres
- ***Alternative C*:**proposes to treat 136 acres

Analysis indicates that prescribed burning would result in 100 percent mortality of conifers that are 6 inches or less, and most shrubs. Burns will be conducted to retain large trees, snags and large down wood. Prescribed burns leave a mosaic of burned and unburned areas, so some shrubs will remain to provide cover for carnivores and prey species using these areas. Habitat modification by these treatments would not affect the over story of mature forest stands in RHCA, used by carnivores as travel corridors.

It is unknown as to how some of the important prey species (small mammals and birds) preferred by marten would respond to the treatments but it is expected that the disturbance would be short-term disturbance. However, the disturbance on habitat for the prey species can have a long-term affect.

Landings and Road Construction

Alternative B would remove more acres of 5D/M and 4D/M compared to Alternative C for new temporary road construction and reconstruction. Refer to the road discussion under the Road Density, CSO and NOGO sections above.The existing traveled roads around the Gibsonville area fragment suitable habitat. It is expected that the marten would avoid the immediate roaded area. The road density is presently high for the project area and will remain so. Under Alternative there is new temporary road construction and reconstruction proposed for this project. Temporary roads are supposed to be removed after the close of the project, however, in many cases this does not happen. Refer to the road discussion under the CSO above.

CUMULATIVE EFFCETS: Cumulative effects are expected to be low. There are no known unavoidable adverse effects. Cumulative effects on thePacific Marten habitat could occur with the incremental reduction of the quantity and/or quality of habitat for these species. Historic fires, timber harvests, recreational use and fire suppressions have extensively modified habitat of the Marten. Overall, increases in urbanization, increases in recreational use of Forest Service system lands, and the utilization of natural resources on state, private and federal lands may contribute to habitat loss for this species. High intensity stand replacement fires, and the methods land managers utilize to control them, have contributed and may continue to contribute to loss of habitat for this species. Cumulative effects on the Pacific Marten could occur if incremental amounts of habitat are lost through a variety of activities over time.

The action alternatives would not increase any large-scale, high-contrast fragmentation above existing levels. The design features would retain habitat elements within the range of those used by the marten for foraging and dispersal, such that proposed treatments would likely not create large barriers to further expansion and connectivity to fisher habitat. There have not been historical detections of marten in the Gibsonville area.

The retention of nesting habitat within California Spotted Owl and Northern goshawk PACs, and RHCAs will provide connectivity between large blocks of suitable habitat. In addition, implementation of Riparian Management Objectives (RMOs) (refer to the Gibsonville Project Aquatic Report and Hydrology Reports 2016) will also improve habitat conditions within riparian.

***Wildfire*:** Refer to the discussion above under CSO. The greatest concern for the Pacific Marten in the Sierra Nevada range is the risk of further fragmentation due to large stand replacing fire (2004 SNFPA FSEIS, page 244). The design features retain habitat elements within the range of those used by marten for foraging and dispersal such that they are not likely to create large barriers to further expansion and connectivity (Ibid, page 243). DFPZs are created as a strategic location to fight wildfires and protect communities but also may reduce the potential for large stand replacing fires.

The Truex/Zielinski 2005 paper "Short-term Effects of Fire and Fire Surrogate Treatments on Fisher Habitat in the Sierra Nevada" was reviewed. Measures to mitigate short-term effects on mustelids, as suggested in the paper, were considered and applied were feasible and applicable. SNFPA ROD 2004 "Standards and Guidelines" were applied to retain large trees, snags, large woody material and large oaks, thereby reducing effects of implementing fuels-reduction ("Fire and Fire Surrogate") treatments such as mechanical harvest, mechanical harvest followed by burn and fire (underburn) only treatments. The paper also states, "The short-term effects of treatments may be mitigated by the beneficial effects of the treatments on subsequent stand development". Marten could be affected by prescribed underburns if they are utilizing an area. They could be directly affected by the fire or by smoke inhalation. The size of the burned area will be small and adults could escape. However, if there were den sites the young could perish since they would not be able to escape.

***Studies/Reports*:** The HFQLG Independent Science Panel "Red Flag" Issue Monitoring Report-2008 recommended that the following question be addressed: "Does DFPZ implementation present a risk to marten movement or marten habitat connectivity?" The publication "Decline in Pacific Marten Occupancy Rates at Sagehen Experimental Forest, California" states "Marten detections in 2007-2008 were 60% lower than in surveys in the 1980s. No martens were detected at lower elevations where most of the recent forest management activity occurred. We suggest that the marten population at SEF has been negatively affected by the loss and fragmentation of habitat. We recommend that future management of forests in the Sagehenbasin focus on restoring and connecting residual marten habitat to improve habitat quality for marten" (Moriarty et al 2011). Also of concern is the mortality of radio-collared marten in the study area on the Lassen NF.

***Connectivity*:** In 2009 a "least-cost path (corridor)" analysis for the Plumas NF was modeled connecting the Lassen NF to the Tahoe NF for the marten. This form of GIS modeling uses a cost/risk surface to evaluate potential animal movement pathways by increasing 'travel costs' in vegetation types they are not commonly associated with (USDA 2009 (*Kirk and Zielinski*). The marten "path" runs directly across the Gibsonville area which also contains the best habitat which provides the "least-cost" pathway. Outside of private lands (timber industry and homeowners), and recreational use (historic cemetery) in the Gibsonville area limit the "path" for marten.

***Uncertainty*:** A potential effect from the proposed forest health treatments is the reduction in the quality of suitable habitat. The key uncertainties related to viability in the Sierra Nevada include (1) factors driving population trends; (2) habitat relationships and habitat quality; (3) current distribution, amount, and quality of habitat; and (4) treatment effects, including fuels and silvicultural treatments, on habitat and populations at multiple scales.

There is a degree of uncertainty as to risk of potential wildfire and disease if treatments were implemented to a lesser degree such as under Alternative C, thereby retaining habitat that is more suitable in terms of canopy cover and layering. Refer to the Gibsonville Project - Silviculture and Fire&FuelsReports 2016. Wildfires are most likely to occur due to recreational activity and private land use in the area which directs the *need* to more aggressively address fuels.

8.9Pallid Bat, Townsend's Big-eared Bat and Fringe–tailed Myotis

*Affected Environment*ref from WILDCAT or SUgarberry

Status

Pallid -The Pallid bat (*Antrozous pallidus)*is listed as a Forest Service Sensitive species in California Region 5 is not state or regional listing by the Fish and Wildlife Service. Current distribution outside of California is from southern British Columbia, Montana to central Mexico, and east to Texas, Oklahoma

There is no indication that there has been a change in the distribution of the pallid bat (USDA 2001b). There is concern for the pallid bat because it is very sensitive to disturbance. Any disturbance, even hiking, can cause the bat to abandon a roosting area completely (Arroyo-Cabrales and Grammont 2008). Also, the use of pesticides has had a serious impact on *A. pallidus* populations (Weber 2009). Bat distribution data on 16 species has been collected (using mist nets, acoustic sampling, and visual inspection of suitable roosting sites) to address project specific needs for more than two decades across the PNF (1991-2013, 206 forest-wide survey locations with bat detections). *A. pallidus* has been detected at multiple locations within each ranger district on the PNF, but our survey data are too patchily distributed, both spatially and temporally, to accurately estimate population size or trend for bat species on PNF.

Townsends- The Townsend big-eared bat (*Corynorhinustownsendii*) is listed as a Forest Service Sensitive species in California Region 5. It is listed as a Species of Concern by the Department of Fish and Game. There is no state or regional listing by the Fish and Wildlife Service. Regionally, the Townsend's big-eared bats are a Species of Special Concern in the states of Texas, Montana and California, a Sensitive species in Oregon, and listed as an Endangered species in Washington.

Throughout California, Townsend's big-eared bat populations have declined over the last 40 to 60 years (USDA 2001b). Approximately 52 percent of historic maternity roosts are no longer occupied, and 40 percent of these sites have been destroyed or rendered unsuitable (USDA 2001b). Recent data used to estimate these trends were collected from a statewide effort (1987-1991) that unfortunately did not occur on PNF. Bat distribution data on 16 species has been collected (using mist nets, acoustic sampling, and

visual inspection of suitable roosting sites) to address project specific needs for more than two decades across the PNF (1991-2013, 206 forest-wide survey locations with bat detections, Natural Resources Information System (NRIS) wildlife database accessed 2014. *C. townsendii*has been detected at multiple locations within each ranger district on the PNF, but our survey data are too patchily distributed, both spatially and temporally, to accurately estimate population size or trend for bat species on PNF.

Myotis - The Fringe-tailed myotis (*Myotisthysanodes*) is listed as a Forest Service Sensitive species in California Region 5. There is little information on size and trend of fringe-tailed myotis populations. Although it may be locally abundant, this widespread species (western North America from British Columbia south to Mexico) also may be locally rare (Keinath 2004). In California, M. thysanodes is distributed statewide except the Central Valley and the Colorado and Mojave Deserts (Mayer and Laudenslayer 1988). Like other California bat species, it appears there have been declines in numbers and colonies of *M. thysanodes*(Keinath 2004; USDA 2005a). No major threats have been identified throughout the species' range, but the Mexican sub species *aztecus*has experienced around a 40 percent reduction in habitat (Arroyo-Cabrales and Grammont 2008). Bat distribution data on 16 species has been collected (using mist nets, acoustic sampling, and visual inspection of suitable roosting sites) to address project specific needs for more than two decades across the PNF (1991-2013, 206 forest-wide survey locations with bat detections). *M. thysanodes*has been detected at multiple locations within each ranger district on the PNF, but our survey data are too patchily distributed, both spatially and temporally, to accurately estimate population size or trend for bat species on PNF.

Surveys

Bat distribution data on 16 species has been collected (using mist nets, acoustic sampling, and visual inspection of suitable roosting sites) to address project specific needs for more than two decades across the Plumas National Forest (1991-2013, 2006, 2015-2016 forest-wide survey locations with bat detections).

Two Pettersson Ultrasound 500X bat detectors were placed in the Gibsonville (Sackett's) Project Area. One was placed within an aspen meadow in the Whiskey Creek area, and one was placed on a ridge within Northern Goshawk Territory T55. Both detectors were placed and started recording on September 12, 2013 and were taken down on October 23, 2013 and were set to record during between 18:45 and 06:45. The detector in T55 did not pick up any bat species, just insect/katydid noise. The detector in the meadow picked up silver-haired bat (*Lasionycterusnoctivagans*), free-tailed bat (*Tadaridabrasiliensis*) and California/Yuma myotis (*Myotiscalifornicus/yumanensis*).

In 2016 a Missouri graduate student, under an "Agreement" with the Plumas NF, conducted a "Bat Habitat Use Study" which included bat surveys within the Gibsonville area. Fringe-tailed bats were detected. However, no bat roosts were located.This study is intended to provide management guidelines for protecting bats and their habitats. If bat roosts, of any species,are located they will be protected.

Pallid-During 2001 and 2002 surveys were conducted in the Slate Creek watershed and in 2006 and 2007 along Mooreville Ridge in the South Fork watershed. Both of these watersheds are south of the Gibsonville area. Surveyed areas were lower in elevation and contained suitable habitat (forests, riparian zones and open-water) and favorable structures (i.e. snags, mines, and rock crevices) particular to the bat species. A number of pallid bats were recorded during the surveys. The majority of detections were at the lower elevational ranges.

Townsends- Townsend big-eared bats where located during the 2006 and 2007 surveys, while surveying for pallid bats,along Mooreville Ridge in the South Fork watershed. See pallid bat surveys to see where areas were surveyed. Outside the project, several bat surveys have been conducted across the Feather

River District to determine the presence, absence and relative abundance of bats. In 2001-2002, in the Slate Creek watershed, Townsend bats were detected in a variety of habitat settings six acoustical sites north of the project area along creeks, at seeps, and in forest settings with mixed hardwood and conifer trees. The elevation for these observations ranged from 4,000 to 6,000 feet.

Several survey techniques where used during those surveys. First, natural roosting features and water source areas were located, then (for Townsend's) surveys incorporated areas with structures such as caves, mines, and riparian areas specific to bats. Mist nets are not generally a good source to located Townsend big-eared bats, as they tend to have a low capture rate. Instead, bats were detected using acoustic sampling methods. Acoustic sampling was used to detect bat ultrasound echolocation calls.

Fringe-tailed Myotis- M. thysanodes has been detected at multiple locations within each ranger district on the Plumas National Forest, but survey data are too patchily distributed, both spatially and temporally, to accurately estimate population size or trend for bat species on Plumas National Forest. The California Department of Fish and Game (2005) recorded occurrences of the fringe-tailed myotis from the Plumas as well as the Angeles, Cleveland, El Dorado, Lassen, San Bernardino, Sequoia, Sierra, Six Rivers, Stanislaus, Tahoe National Forests, and the Lake Tahoe Basin Management Unit.

Analysis Area Occurrence Potential**ref from WILDCAT or Sugarloaf**

The analysis area falls within the historic range for all three bat species. There is suitable roosting and foraging habitat that includes mixed conifer, white fir, hardwood and riparian habitats. In surveys conducted in 2016, Fringe-tailed bats were detected within the Gibsonville area but no roosts were located. Townsends and Pallid bats were not detected.

Pallid bat-Roost results for surveys conducted near the project area found bats in incense cedar, Jeffery pine and in a bridge, all day roosts where within an open forest canopy, with large size trees greater than 20 inch DBH. Based on the literature and recent surveys the Pallid bat tends to prefer open to semi-open coniferous habitat along predominant ridge tops. Habitat typically includes features such as snags, decaying logs, grasslands/meadows openings and unpaved roads. Recent surveys in northern California showed that while pallid bats are documented as using rock crevices (Rambaldini 2006 *in* Baker et al. 2007) the majority of roost found pallid bats in live trees or snags that were large in diameter, tall in height, and located in stands of mature trees (Baker et al. 2007). Pallid bats have been known to roost in dead trees (snags), live trees greater than 20" dbh (especially those with decay), rock outcrops, leaf litter and bridges.

A. pallidus occur in a wide variety of habitats, including grasslands, shrublands, and woodlands to mixed conifer forests (USDA 2001b). They are most abundant below 6,000 feet elevation, but have been recorded up to 10,000 feet in the Sierra Nevada (USDA 2001b). Bats commonly occupy open, dry habitats with rocky areas for roosting. They day roost in caves, crevices, mines, and occasionally in hollow trees/snags, crevices in oaks, and snags (USDA 2001b). Philpott (1997) emphasized the importance of oak woodlands for foraging in this species, and the 2001 SNFPA FEIS (USDA 2001b) emphasized protection and enhancement of oak habitat components (westside foothill and montane oaks) to provide and maintain *A. pallidus* foraging habitat.

On the FRRD they were even documented using an exposed tree root bole. They will forage in the grasslands/meadows, open to semi-open forest and shrub fields. They forage less in riparian zones but riparian zones are usually present nearby to roost sites and forage areas. Radio-tracked Pallid bats tend to travel an average of 1 mile between the roost site and the foraging areas.

Townsend's big-eared bat-*C. townsendii*are usually found below 6,000 feet but have been found up to 10,000 feet elevation occupying a wide variety of habitats (older forest, desert, grasslands/plains, riparian, coastal; Philpott 1997, Pierson and Rainey 1998, Pierson et al. 1999). Roosting habitat requires caves, mines, abandoned human structures, and rock crevices; and access to drinking water (Philpott 1997, Pierson and Rainey 1998, Pierson et al. 1999). *C. townsendii*forages in a variety of habitats (riparian areas, old forests, mixed hardwood-conifer forest) feeding primarily on the wing for flying insects (specializing in moths) or by gleaning from foliage (Philpott 1997, Pierson and Rainey 1998, Pierson et al. 1999). *C. townsendii*appears to prefer mesic habitats, and often forage along habitat edges (Philpott 1997, Pierson and Rainey 1998, Pierson et al. 1999). Townsend's big-eared bats form maternity colonies of up to several hundred females. These colonies show a high degree of roost fidelity, and, if undisturbed, colonies may occupy the same roost indefinitely (Philpott 1997, Pierson and Rainey 1998, Pierson et al. 1999). Its colonial nature places this bat at high risk with a single disturbance causing detrimental harm to potentially large populations (Philpott 1997).

The distribution of this species is highly correlated with the availability of caves or cave-like roosting habitat such as abandoned buildings and mine openings. There are no caves and there are few mine openings and abandon buildings in the analysis area. However, Townsend's have also been known to utilize live trees and snags greater than 20" dbh. Local rarity combined with characteristic low intensity of calls making them difficult to detect, even when present. Although it is a low likelihood of Townsend bats within Gibsonville area, it is possible.

There is suitable habitat for Townsend big-eared bats to roost and forage in many areas across the forest, including the project area. The project falls within the historic range. Townsend's big-eared bats occupy a wide variety of habitats (older forest, desert, grasslands/plains, riparian, coastal). Roosting habitat requires caves, mines, abandoned human structures, rock crevices, and water for drinking. They forage in a variety of habitats, including riparian areas, old forests, and mixed hardwood-conifer forest. They feed primarily on flying insects, specializing in moths, and it usually captures prey in flight, or by gleaning from foliage of brush or trees.

Fringe-tailed Myotis-*M. thysanodes*most frequently is observed at middle elevations (3,900–7,050 feet) in desert, grassland, and woodland habitats, but ranges between coastal areas along the Pacific Ocean to 9,350 feet in spruce-fir habitat in New Mexico; (Keinath 2004, 2005). The fringe-tailed myotis roosts in a wide variety of structures and has been recorded hibernating in mines, buildings, (CDFG 2005), oak and pinyon woodlands (Bradley et al. 2005), and snags (Keinath 2005).Oak and pinyon woodlands appear to be the most commonly used habitat, and bats roost in dead trees (Weller and Zabel 2001), caves, mines, rock crevices, buildings, and other protected sites with nearby access to drinking water (Keinath 2004). In Douglas fir forests of northern California, fringe-tailed myotis day roosts were found exclusively in snags of early to medium stages of decay (USDA 2005). Roost sites were characterized by having more snags, less canopy cover, and were closer to streams than random sites (USDA 2005). Nursery colonies occur in caves, mines, and sometimes buildings (Keinath 2004). Individuals are known to move up to five miles between roosting and foraging areas (Keinath 2004). Thermoregulatory requirements result in bats periodically shifting the specific roost site occupied within a colony to adapt to fluctuations in climatic conditions (e.g., clusters of bats move in response to temperature changes in different parts of the roost, (Keinath 2004). Fringed bats are known to migrate, but little is known about the magnitude of movements. Diet includes beetles and moths. *M. thysanodes*forages close to the vegetative canopy, and has relatively slow and highly maneuverable flight (Keinath 2004).

The likelihood of occurrence for *M. thysanodes*increases as the number of snags greater than 12 inches dbh increases and percent canopy cover decreases (Keinath 2004). *M. thysanodes*day and night roost

under bark and in tree hollows, and bats exclusively used snags for day roost sites in Douglas-fir (*Pseudotsugamenziesii*) forest in Northwestern California (Six Rivers National Forest data, Weller and Zabel 2001). All roost trees were snags in early to medium stages of decay, and bats switched roosts often (number of bats exiting roosts varied from 1 to 88). The most important factor that discriminated roost sites from random sites at this study site was 5.4 or more snags ≥ 12 inches dbh at roost sites. Roost snags were 85 feet taller and had diameters 17 inches larger than random snags in the surrounding watershed, and roost sites had 11 percent less canopy cover and were 135 feet closer to stream channels than random sites (Weller and Zabel 2001).

Environmental Consequences

No Action Alternative (Alternative A)

DIRECT EFFECTS: There would be no direct effects on bats or bat habitat, as no activities would occur that would cause disturbance to denning bats, nor any impacts to the existing habitat conditions.

INDIRECT EFFECTS: Indirect effects of no action include the potential for future wildfire and its impact on habitat development and recovery. The fuel loads that would be left by this alternative would make potential wildfires in the area difficult to suppress and create a more intense burn, which could lead to increased rates of spread resulting in potential modification of suitable bat habitat including the loss of large trees, large snags and down woody material.

CUMULATIVE EFFCETS: There would be no actions designed to reduce the ***potential***risk of high intensity wildfire or forest health.

Action Alternatives:AlternativesBand C

DIRECT and INDIRECT EFFECTS: Direct and indirect effectsare expected to be low because:

- There are no known roost sites in the analysis area.
- Limited historical surveys were conducted within the analysis area.
- Limited Operating Periods are included to protect any roost sites if they are located.
- Many acres of suitable mature/older forest will be avoided because there will be no mechanical thin treatments in CSO or NOGO PACs.
- Treatments are staying out of RHCAs except for understory burning and some handcut/pile/burn.
- Large Trees: trees 30 inches dbh and greater would be retained, except for operability and safety
- Snags: 4-6 snags per acre, 15 inches dbh or greater would be retained, where feasible.
- LDW: 10-15 tons per acres of large down logs would be retained, where available, and no YUM.
- Retention and enhancement of all cottonwood trees.
- Best Management Practices would be applied.

Refer to**Tables 3-10 and Figure 4**above.Alternative C would have less potential impact as compared to Alternative B because it reduces the number of acres where trees 20”dbh or greater would be removed.Alternative C would benefit habitat by promoting forest health and reducing the threat of fire, while maintaining the larger trees. Refer to the discussion of effects above for the large trees, snags and large down wood. If sensitive bat species are found or recent activity is located at additional locations during project implementation the district biologist would be notified and develop and implement mitigations to protect roosting individuals, thereby further reducing any disturbance effects to individuals or breeding populations from project activities.

Destruction of active roosts through felling and/or removal of large trees, or small trees with hollows, or mature oaks could displace or harm individual bats. Snags removed for safety reasons, could result in direct mortality of bat species that may be roosting within the tree or snag. Adults may be able to flee from the destruction of their roost tree. However, if activities were to take place during the spring and early summer juvenile bats, prior to initiation of flight skills, would have no means of escaping direct disturbance and would be killed if roost trees were felled. In addition, bats primarily forage at dusk or night when project activities would be minimal or not occurring.

Chain saw activity or the use of heavy equipment causing ground vibrations may cause noise and tremor disturbance significant enough to cause temporary or permanent roost abandonment. However, machinery used for mechanized treatment would disturb most tree-roosting bats prior to tree removal activities, and therefore reduce the potential for direct mortality of these species. If activities were to take place during the spring and early summer, juvenile bats would have no means of escaping direct disturbance and would perish if maternity roosts were abandoned. If bats are roosting in trees that are not felled or trees adjacent to the treatment area, temporary or permanent roost abandonment could also result in lowered reproductive success or possibly, total maternity roost abandonment and death of the young of the year.

Analysis indicates that prescribed burning would result in 100 percent mortality in conifers up to 6"dbh and most shrubs. Burns will be conducted to retain snags and large down wood. Prescribed burns leave a mosaic of burned and unburned areas, so some shrubs will remain to provide cover for carnivores and prey species using these areas. Habitat modification by these treatments would not affect the over story of mature forest stands in RHCA. However, fires could kill some larger trees that could be utilized as roosts. Smoke inhalation could kill bats. Adults could fly away from the burn but if young cannot fly they would perish. Prescribed burns done in the spring could affect pallid bats, due to their habitat preferences. Conducting prescribed burns during fall months will minimize the risk of mortality to bats. By fall, the young can fly, and hibernation has not yet begun.

Destruction of active roosts through felling and/or removal of large trees, or small trees with hollows, or mature oaks could displace or harm individual bats. Snags removed for safety or operability reasons, could result in direct mortality of bat species that may be roosting within the tree or snag. Adults may be able to flee from the destruction of their roost tree. However, if activities were to take place during the spring and early summer juvenile bats, prior to initiation of flight skills, would have no means of escaping direct disturbance and would be killed if roost trees were felled. Arousal from hibernation accounts for more than 80 percent of the energy expended by bats during hibernation (Bradley et al. 2005). If hibernating bats are disturbed, they awaken. Arousal from hibernation increases the possibility that the bat's stored fat will be insufficient to keep it alive through winter (O'Farrell and Studier 1980).

The retention of decadent hardwoods is recognized for their importance to bats and their contribution to snag densities. For the fringe tail myotis the most important factor that discriminated roost sites from random sites at this study site was 5.4 or more snags ≥ 12 inches dbh at roost sites. Roost snags were 85 feet taller and had diameters 17 inches larger than random snags in the surrounding watershed, and roost sites had 11% less canopy cover and were 135 feet closer to stream channels than random sites (Weller and Zabel 2001). Common stand exams in the project area noted that there appeared to be suitable numbers of snags greater than 15 inches throughout the project units, predominantly within the owl and goshawk PACs.

The possibility for incidental loss of snags during logging operations is unknown, but some level of loss would occur giving the realities of ground based operations and associated activities. Individual snags and pieces of downed wood would be lost through felling of snags that pose a hazard to workers and

equipment. Operators try to avoid snags for two reasons, no economic value and two it requires equipment and time to remove a snag. Management direction is to retain four of the largest snags per acre (SNFPA ROD 2004b). To avoid limiting snag retention opportunities, for the Gibsonville Project the mitigation is to retain all snags in the project.

CUMULATIVE EFFCETS: Cumulative effects associated with the habitat are expected to be low. Effects to bat species occur predominately from potential loss of roost trees, disturbance during roosting attempts, and disturbance to prey base. It is not possible to predict the mortality of species during project implementation. The unknown location of bats for instance is conjectural. Species, such as bats are challenging to locate requiring labor-intensive surveys. While the California bat species appear to be declining in numbers and colonies (Keinath 2004; USFS 2005). The threats are varied and it is difficult to pinpoint the exact reasons because everything from pesticides, to diseases, and increases in urbanization, increases in recreational use and the utilization of natural resources on state, private and federal lands may contribute to the loss of bat species. The expected retention of snags, oaks, and the limited treatment in riparian areas as well as owl and goshawk PACs support habitat availability for bats. In addition, the Forest Service bat sensitive species tightly associated to mines, caves or abandoned structures for resting or roosting and riparian water sources for foraging. Proposed fuels reduction activities may reduce the threat of high intensity, stand replacing fires, thus providing some protection to residual habitat attributes such as large trees, snags, large down wood and mature hardwoods.

8.12 Bumble bee

Affected Environment

Status:
The western bumble bee, *Bombusoccidentalis,* is currently managed as a USDA Forest Service sensitive species in accordance with the proposed USFS Region 5 2013 update.

Historically, *B.occidentalis*was one of the most broadly distributed bumble bee species in North America, distributed along the Pacific Coast and westward from Alaska to the Colorado Rocky Mountains (Thorp and Shepard 2005, Cameron et al. 2011, Koch et al. 2012). *B. occidentalis*currently occurs in California and all adjacent states, but is experiencing severe declines in distribution and abundance due to a variety of factors including diseases and loss of genetic diversity (Tommasi et al. 2004, Cameron et al. 2011, Koch et al. 2012). Collection records provide the best available data on *B. occidentalis*distribution in the Sierra Nevada, and 94 records (22%) from the Pacific Southwest Region were collected on the Plumas NF (Hatfield 2012). Although the general distribution trend is steeply downward, especially in the west coast states, some isolated populations in Oregon and the Rocky Mountains appear stable (Rao et al. 2011, Koch et al. 2012). The overall status of populations in the west is largely dependent on geographic region: populations west of the Cascade and Sierra Nevada mountains are experiencing dire circumstances with steeply declining numbers, while those to the east of this dividing line are more secure with relatively unchanged population sizes. The reasons for these differences are not known.

*B. occidentalis*populations and their habitats are threatened by diverse factors, including but not limited to habitat loss and fragmentation, contaminants, parasites, and habitat alteration resulting from fire suppression. Habitat alteration (e.g., agricultural and urban development) may fragment or reduce the availability of flowers that produce nectar and pollen bumble bees require, and habitat alteration also may decrease the number of abandoned rodent burrows that provide nest and hibernation sites for queens. Invasive species also are impacting *B. occidentalis*, as bumble bees introduced from Europe for commercial pollination apparently carried a microsporidian parasite, *Nosemabombi*, which has been introduced into and impacted native bumble bee populations (Cameron et al. 2011). Exposure to

organophosphate, carbamate, pyrethroid and particularly neonicotinoid insecticides has recently been identified as a major contributor to the decline of many pollinating bees, including honey bees and bumble bees (Henry et al. 2012, Hopwood et al. 2012). Further, fire suppression in many systems has permitted native conifers to encroach upon meadows, which decreases foraging and nesting habitat.WC

Surveys:

Surveys specific for B. occidentalis have not been conducted in the analysis area. However, bumble bee species were incidentally located within the meadow areas. Botanical surveys within the Gibsonville project area reported numerous occurrences of flowering plant species known to be used by B. occidentalis listed below. Suitable plants were within meadows and other openings such as along roads and within old landings. *B. occidentalis*is suspected to be present, but not documented.

Analysis Area Occurrence Potential:

Queens overwinter in the ground in abandoned rodent (i.e. mouse, chipmunk or vole) nests at depths from 6-18 inches and typically emerge about mid-March (Heinrich 1979). The queen then lays fertilized eggs and nurtures a new generation, and individuals emerging from fertilized eggs will become workers that reach peak abundance during July and August (Heinrich 1979). Foraging individuals are largely absent by the end of September, and those that emerge from unfertilized eggs become males, which do not forage and only serve the function of reproducing with newly emerged queens (Heinrich 1979). Queens produce between fifty to hundreds of individuals annually, depending on the quantity and quality of flowers available. When the colony no longer produces workers, the old queen will eventually die and newly emerged queens will mate with males and then disperse to found new colonies (Heinrich 1979). During these dispersal flights, which may last two weeks, new queens may make several stops to examine the ground for a suitable burrow. Mikkola (1984) reported that bumble bees may forage up to a distance of 80 km from the nest in search of food.

Unlike all other bees, bumble bees are large enough to be capable of thermoregulation, which allow them to maintain their foraging activities for longer periods of the day, but also to occupy regions with more extreme latitudes and temperatures compared to other bees (Heinrich 1979). Bumble bees may continue to forage when temperatures are below freezing even in inclement weather (Heinrich 1979). Queens end the year by locating a sheltering burrow, where they may spend the winter months under cover. Where nesting habitat is scarce, bumble bee species having queens that emerge early (mid-March) in the season like *B. vosnesenskii*which co-occurs with the later emerging *B. occidentalis*, may be able to monopolize available nest sites and reduce the chances of success for bumble bee species emerging later. WC

Western bumble bees have a short proboscis or tongue length relative to other co-occurring bumble bee species, which restricts nectar gathering to flowers with short corolla lengths and limits the variety of flower species it is able to exploit. Western bumble bees have been observed taking nectar from a variety of flowering plants, including *Aster spp. (**Asters**), Brassica spp. (**Mustard family**), Centaurea spp. (**thistles**), Cimicifugaarizonica (**Arizona bugbane**), Corydalis caseana (**Sierra fumewort**), Chrysothamnus spp. (**Rabbit bush**), Cirsium spp.(**thistles**) , Cosmos spp. (**Cosmos**), Dahlia spp. (**Dahlia**) , Delphinium nuttallianum (**Larkspur**), Erica carnea (**Heath family**), Erythronium grandiflorum (**Glacier lily**), Foeniculum spp. (**Carrot family**), Gaultheria shallon (**Salal**), Geranium spp. (**Craneshills**), Gladiolus spp. (**Iris family**), Grindelia spp. (**Sunflower family**), Haplopappus spp. (**Aster family**), Hedysarumalpinum (**Alpine sweetvetch**), Hypochoeris spp. (**Dandelion family or Cats Ear**), Ipomopsisaggregate (**Scarlet trumpet or Honeysuckle**), Lathyrus spp. (**Sweet pea**), Linaria vulgaris (**Common toadflax**), Lotus spp. (**genus of Legume family**), Lupinusmonticola (**Mountain lupine**), Mentha spp. (**Mint family**), Medicago spp. (**Includys alfalfa**), Melilotus spp. (**Sweet clover**),*

*Mertensiaciliate (**Mountain bluebells**), Monardella spp. (**Wildmints**), Nama spp., Origanum spp. (**genus including oregano and marjoram**), Orthocarpus spp. (**Indian Paintbrush, Owls clover**), Pedicullariscapitate (**Capitate lousewort**), P. kanei (**Woolly lousewort**), and P. langsdorfii (**Langsdorf's lousewort**), P. groenlandica (**Elephant's head**), Penstemon procerus (**Littleflowerpenstemon**), Phacelia spp. (**Scorpion weed**), Prunus spp. (**Stonefruit, genus of Rosaceae**), Raphanus spp. (**Radish**), Rhododendron spp. (**Heath family, Ericaceae**), Salix spp. (**Willow family**), Salvia spp. (**Sage family**), Solidago spp. (**Goldenrod**), Symphoricarpos spp. (**Snowberry, waxberry, ghostberry, honeysuckle family**), Tanacetum spp. (**Feverfew, Pianted daisy, aster family**), Taraxacum spp. (**Dandelion**), Trifoliumdasyphyllum (**Alpine clover**), Trichostema spp. (**Blue-curls**), Trifolium spp. (**Clover**) and Zea spp.*(**Poaceae, Grass family**)(Evans et al. 2008).WC

The Gibsonville area identified the following plants within meadows or other openings, known to be preferred by the B occidentalis:Solidago (**Goldenrod**), Cirsiumvulgans (**Bullthistle**) ***Non-native and pulled when located), Trifoliumspp (**Clover** species including T. cyathiferum (**Cup clover**), T. hybridum (**Alsike clover**), T. wormskioldii (**Cow clover**), Centaureaspp (**thistles**), Salix spp. (**Willow** species including S. scouleriana (**Scouler's willow**), Chrysothamnusnauseosus (**Rubber rabbitbrush**) and Ericameriabloomeri (**Bloomer's rabbitbush or gondenbush**). Also, Stachysajugoides (**Bugle hedgenettle, in the mint family**) which was not listed above but is known to be favored by B. occidentalis in California.

Environmental Consequences

No Action Alternative (Alternative A)

DIRECT EFFECTS: There would be no direct effects on Bumble bees or bee habitat, as no activities would occur that would cause disturbance to bees, nor any impacts to the existing habitat conditions.

INDIRECT EFFECTS: Indirect effects of no action include the potential for future wildfire and its impact on habitat development and recovery. The fuel loads that would be left by this alternative would make potential wildfires in the area difficult to suppress and create a more intense burn, which could lead to increased rates of spread resulting in potential modification of suitable bat habitat including the loss of meadow vegetation. However, it is unclear regarding how much of an impact that would be considering meadows have evolved with natural fires.

CUMULATIVE EFFCETS: There would be no actions designed to reduce thepotential risk of high intensity wildfires.

Action Alternatives:Alternatives B and C

DIRECT and INDIRECT EFFECTS: Direct and indirect effects are expected to be low. Although potential direct effects on B. occidentalis include mortality of individuals or entire nesting colonies, it is difficult to precisely quantify the risk of and occurrence of such events for this species. Some of the flowering plant species (nectar sources) known to be used by B. occidentalis occur within meadows and open areas, such as along roads, in the analysis area (see Gibsonville Project - Botany BE 2016).

Refer to **Tables 3-19, and Figure 2 and 4** above. Ground disturbing activities proposed, such as VDT and Aspen Release, Mastication and Roadside Hazard Tree Removal, could likely reduce foraging opportunities for *B. occidentalis*in the project footprint (treatment units) in the short-term; however, this reduction in foraging habitat likely will be ephemeral as flowering plants will sprout and regenerate post-project. Ground disturbing activities also may destroy suitable nesting and overwintering sites for *B. occidentalis*within treatment units. The opening up of the forest canopy, combined with the effects of

prescribed fire, is expected to enhance flowering plant density, and therefore increase the ability of the landscape to support western bumblebee.

Non-mechanical, non-ground disturbingactivities, such as HCPB, Meadow/Riparian Restoration, and underburningare very limited in time and size, and although there could be a certain level of disturbance to bees the activities will not likely impact individuals or reduce foraging opportunities. With equipment exclusion zones, riparian and meadow areas will not experience ground disturbing activities and will provide foraging, nesting, and over wintering opportunities of the Gibsonville project area.

Throughout the project, both spatially and temporally, there will be habitat refugia for *B. occidentalis*via untreated areas and RCA equipment exclusion zones. RCA equipment exclusion zones will receive minimal disturbance during the project. As neither untreated nor RCA equipment exclusion zones area will experience significant ground disturbing activity, we expect suitable nesting and overwintering sites to persist throughout the length of the project. Further, given the linear nature of RCAs, equipment exclusion zones within RCAs also serve as habitat corridors for *B. occidentalis*, providing habitat connectivity between and among foraging and nesting habitat.

Cumulative Effects: The existing condition reflects the changes of all activities that have occurred in the past. The analysis of cumulative effects of the action alternative evaluates the impact on bees from the existing condition within the analysis area. Cumulative effects on B. occidentalis could occur with the incremental loss of the quantity and/or quality of habitat for this species. Overall, increases in urbanization, increases in recreational use of National Forest System lands, and the utilization of natural resources on state, private and federal lands may contribute to habitat loss for this species. Although the general distribution trend is steeply downward, especially in the west coast states, some isolated populations in Oregon and the Rocky Mountains appear stable (Rao et al. 2011, Koch et al. 2012). The overall status of populations in the west is largely dependent on geographic region: populations west of the Cascade and Sierra Nevada mountains are experiencing dire circumstances with steeply declining numbers, while those to the east of this dividing line are more secure with relatively unchanged population sizes. The reasons for these differences are not known.

Bumble bees are threatened by many kinds of habitat alterations that may fragment or reduce the availability of flowers that produce the nectar and pollen they require, and decrease the number of abandoned rodent burrows that provide nest and hibernation sites for queens. Major threats that alter landscapes and habitat required by bumble bees include agricultural and urban development. Exposure to organophosphate, carbonate, parathyroid and particularly neonicotinoid insecticides has recently been identified as a major contributor to the decline of many pollinating bees, including honey bees and bumble bees (Henry et al. 2012, Hopwood et al. 2012). In the absence of fire, native conifers encroach upon meadows, which also decreases foraging and nesting habitat available for bumble bees.

The woodcutting and Christmas tree cutting programs on the PNF are ongoing programs that have been in existence for years and are expected to continue. The past and future effect of the woodcutting program has and would be to reduce snags, in all forest types, along roadsides throughout much of the analysis area. However, snag and log removal through the woodcutting program has a limited spatial impact across the PNF as woodcutting is only permitted along open roads (within 100 feet). With the current PNF woodcutting program, the terrestrial wildlife analysis area would be open to public woodcutting 12 months a year, limited only by available access. Loss of these habitat features may indirectly impact nesting and wintering site availability (i.e., rodent burrows). Uncontrolled public use, especially during the nesting season, may cause disturbance to nesting colonies. However, *B. occidentalis*colonies are capable of deterring people and other animals from trampling the nest by repeatedly stinging them.

Most recreation use in the wildlife analysis areas consists of camping, hiking, aquatic activities, horseback riding, hunting, fishing, mining, mountain biking, OHV use, pleasure driving, and wildlife watching. Recreational use is expected to continue at the current rate. These activities are expected to have a nominal effect on *B. occidentalis*.

9. CUMULATIVE EFFECTS COMMON TO ALL ACTION ALTERNATIVES

The cumulative effects of this project on wildlife species include those effects from past, present, and reasonably foreseeable projects occurring in the Gibsonville Project wildlife analysis area, which includes **3,952 acres** of National Forest System land. Past activities are considered part of the existing condition and are discussed in the "Affected Environment and Existing Conditions", and "Environmental Effects" sections for each resource.

The cumulative effects are typically based on components starting with the understanding of the general status and trends of trying to predict how the activity would influence the natural workings of the habitat. For the purpose of the cumulative effects analysis, it is assumed that the current vegetation conditions reflect the sum of all past human-caused and natural disturbances within the planning area. It is uncertainexactly what the wildlife species cumulative impact will be from these actions but some level of effects is expected. Proposed treatments for the Gibsonville Project are expected to result in low incremental impact when added to actions on the private land. Short-term habitat suitability reductions by implementation of either action alternative will be offset by fuel treatments that in the long-term would reduce the potential risk of loss of wildlife habitat to wildfire, insect or disease, which can lead to large-scale habitat loss.

9.1 Past, Present and Foreseeable Future

The following is from the Gibsonville Project –Silviculture& Hydrology Reports, 2016. In order to understand the contribution of past actions to the cumulative effects of the proposed action and alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

The Council of Environmental Quality (CEQ) issued an interpretive memorandum on June 24, 2005 regarding analysis of past actions, which states, "agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions." For these reasons, the analysis of past actions in this section is based on current environmental conditions.

The cumulative effect of past management practices, logging, mining, fire exclusion, and high-mortality fires have largely shaped the forest that exists in the project area today. These past projects and events are reflected in the vegetation layer used to characterize the existing conditions (the baselines for analysis) in the project area.

Table 22 displays the past, present, and foreseeable future actions or activities that have contributed to the current environmental conditions. Timber harvest activities presented in this appendix are activities that occurred within the CWE analysis area (Subwatershed 1-6) within the past 25 years both on NFS land and private. Activities planned in 2016 besides the proposed action is considered future foreseeable actions and anything prior is considered to be past activities. The past NFS timber activities were derived from the FACTS (Forest Service Activity Tracking System) database. A GIS shapefile of Timber Harvest Plans (THPs) were attained from the California Department of Forestry and Fire Protection (CALFIRE) for the

past and future foreseeable private timber harvest activities. Imagery from various years was used to determine areas that had past timber activities that weren't covered by the FACTS database and the THP shapefile. The acres and timber harvest activities (prescriptions) reflected in this appendix is as accurate as possible because the missing data gaps were filled in by the aerial photos and professional judgement.

Changes in vegetation structure as a result of fires and recent past projects since the baseline data was collected has been incorporated into the Gibsonville Project's cumulative effects analysis. The table displays the acres for each project, the type of activity, and the number of acres that are located within the Gibsonville project and sub-watershed analysis areas.

The projects listed in **Table 22** would have no cumulative effects on vegetation attributes (i.e., tree density, canopy cover, species composition, stand structure, etc.) since the treatments themselves (i.e., underburning, hand cutting, or mastication) would have minimal effects. At the sub-watershed level (3,952 acres), Alternatives B and C would have a less than a 13.2 percent change in the small to large trees (i.e., canopy cover, stand structure, and landscape structure).

Roadside hazard tree projects have been determined to have no cumulative effects to vegetation attributes (i.e., tree density, canopy cover, species composition, stand structure, etc.) since they would remove approximately two to six trees per acre along a 150-200 foot road corridor (see Appendix C, Table C-1). Roadside hazard tree projects also would not change seral stage diversity classes (i.e., CWHR size and density classes for each vegetation type).

Botanical (i.e., aspen restoration, noxious weed control), watershed (i.e., meadow or stream restoration), special uses (i.e., mining) and wildlife projects (i.e., oak enhancement) projects are generally not implemented at a scale (i.e., less than 70 acres) or location to influence vegetation attributes on a project or landscape-level analysis area. Christmas trees and fuel wood cutting have a negligible effect on vegetation attributes at a project and landscape-level analysis area due limited access (i.e., adjacent to roads) and to the seasonal and dispersed nature of these activities.

The desired conditions for maintaining various seral stages or timber strata by vegetation type, size class, and canopy cover (CWHR) does not include lands on private property. Therefore, harvest or thinning projects on private property would have no cumulative effects on vegetation attributes, (i.e., tree density, canopy cover, species composition, stand structure, etc.) for the Gibsonville project.

9.2 Private

Of the 5,330 acre wildlife analysis area for the Gibsonville Project area, there are 1,378 acres of private lands. The nature of the private lands is that they are managed for industrial timber such as by Sierra Pacific Industries or other private inholdings. In general, these private lands are treated with different objectives than National Forest lands and therefore are minimally or not suitable as habitat for mature/older-forest dependent species. Sierra Pacific Industries, the largest private landowners in the analysis area, has outlined strategies that provide "certain" owl protections on their land. The company implements such activities such as conducting surveys for spotted owls before timber harvests, and/or buffer nest centers from disturbances, and/or protect forest units with nesting spotted owls from harvest altogether. The industry lands southwest of the Gibsonville project area (Goat Mountain area), and lands directly west (Gibsonville Ridge) of the Gibsonville project area have been managed for timer production. The majority of the industry timber lands are not expected to be highly suitable habitat for the owl. The land owned by a private landowner in Section 19 is not considered suitable wildlife habitat for T&E or FS Sensitive species.Refer to Gibsonville Project - Silviculture and Hydrology Reports, 2016 for future discussion regarding private lands

Table 22. Past, Present, and Future Foreseeable Actions within the Gibsonville Sub-Watersheds.

PAST, PRESENT, AND FUTURE ACTIONS	ACRES	TIME PERIOD	PROJECT LEVEL CUMULATIVE EFFECTS (Indicators and Units of Measure) (1,200 ACRES)				SUB-WATERSHED AREA CUMULATIVE EFFECTS (3,952 ACRES)
			FOREST HEALTH INDICATOR		FIRE RESISTENCE INDICATOR		
PROJECT / ACTIVITY			Trees per Acre	Basal Area	Stand Structure - Trees per Acre by DBH Classes	Stand Structure - Canopy Cover by DBH Classes	CWHR DIVERSITY & LANDSCAPE STRUCTURE
PAST PROJECTS	NA	< 2000	Cumulative effects of past projects were taken into account based upon the updated timber type layers and the 2012 aerial photograph interpretation		Cumulative effects of past projects were taken into account based upon the updated timber type layers and the 2012 aerial photograph interpretation		Effects of past projects were taken into account for CWHR habitat analysis using the updated GIS timber type layers
Gibsonville Resale	4.6	1997	Very minimal effect. Less than 1.0% overall change		Very minimal effect. Less than 1.0% overall change		Very minimal effect. Less than 0.3% overall change
Tree Release and Weed	7.2	2000					
Pre-commercial Thin	45.7	2003	Very minimal effect. Less than 3.8% overall change		Very minimal effect. Less than 3.8% overall change		Very minimal effect Less than 1.2% overall change
La Porte-Quincy Hazard Tree	28.8	2014	An average of 2-6 trees per acre removed. Very minimal effect.		An average of 2-6 trees per acre removed. Very minimal effect.		An average of 2-6 trees per acre removed. Very minimal effect.
Single Tree Selection	1.9	2015					
Gibsonville Project							
Variable Density Thinning	359	2017-2018	Commercial thin is about 30% of the project.		Commercial thin is about 30% of the project.		Low effect. Less than 9.1% overall change.
Roadside Hazard	115	2017-2018	Roadside hazard tree removal is about 9.6% of the project. An average of 2-6 trees per acre removed.		Roadside hazard tree removal is about 9.6% of the project. An average of 2-6 trees per acre removed.		Very minimal effect. Less than 2.9% overall change.
Aspen, Meadow, and Riparian Restoration	48	2017-2018	Restoration treatments are about 4.0% of the project.		Restoration treatments are about 4.0% of the project.		Very minimal effect. Less than 1.2% overall change.
Mastication and Underburing	181	2018-2019	Mastication is about 15.1% of the project.		Mastication is about 15.1% of the project. Minimal effect to canopy cover.		Minimal effect. Less than 4.6% overall change.
Handcut Pile burn and Underburn	352	2018-2019	Handcutting and underburning are about 29.3% of the project.		Handcutting and underburning are about 29.3% of the project. Minimal effect to canopy cover.		Low effect. Less than 8.9% overall change.
Sugarloaf Project	34	2018-2020	Very minimal effect. Less than 2.8% overall change		Very minimal effect. Less than 2.8% overall change		Very minimal effect. Less than 0.9% overall change
Tree Release and Weed							

Notes: Sub-watershed acres does not include acres from private land.

9.3 Climate Change Trends

The following is from the Gibsonville Project -Silvicutural Report, 2016 ***(USDA 2016c)*****.** The majority of scientific research concerning climate trends indicates that climate has been changing likely due to the increase in human activities which emit greenhouse gases such as the combustion of fossil fuels. Trends suggest that the Northern Sierra Nevada may become generally warmer and wetter, with longer periods of prolonged summer drought. While warmer and wetter weather patterns may increase forest growth and carbon sequestration, warmer temperatures in combination with longer periods of prolonged summer drought may likely increase forest insect and disease outbreaks and the occurrence of high severity fire – disturbances which may result in increased carbon losses. Such high severity disturbances could result in conversion of forest to shrub lands in forested ecosystems that are not adapted to such disturbance patterns – which could drastically alter carbon cycles in the short and long term.

Current trends have been quantified showing an increase in the proportion of high severity fire in the Sierra Nevada mountain range. High severity patches more than a few acres in size were unusual in fires in the Sierra Nevada before Euro-American settlement (Show and Kotok 1924, Kilgore 1973, Stephenson et al 1991, Skinner 1995, Skinner and Chang 1996, Weatherspoon and Skinner 1996). Miller et al. (2009) have also shown that the average size of high severity patches in Sierra Nevada wildfires has increased by about 100% over the last 25 years.

While the occurrence of fire (including low, moderate, and high severity fire) on the landscape is a natural disturbance that is essential to ecosystem function, the large scale of these fires, particularly the vast proportion that burned under high severity, are well outside the natural range of variability in fire size and severity experienced on the Plumas National Forest in the past and are uncharacteristic of the "natural" fire regimes typically described for the dry Sierra Nevada forests (Miller et al. 2009, Safford et al. 2007, Beaty and Taylor 2007, Moody and Stephens 2002, Beaty and Taylor 2001, Gruell 2001, McKelvey et al. 1996, Weatherspoon 1996, Weatherspoon and Skinner 1996, Skinner and Chang 1996, McKelvey and Johnston 1992).

In addition, recent occurrences of large scale Heterobasidion root disease and bark beetle outbreaks have been linked to recent drought periods that have affected areas in the Southern California Mountains, and in the Lake Tahoe area (Guarin and Taylor 2005, Macomber and Woodock 1994). Such disturbances that result in abnormally large levels of mortality have the potential to affect fuels dynamics, potential fire behavior, and resulting future forest structure and composition.

Such warming trends may lead to the reproductive and overwintering success of forest pathogens and insects, thereby increasing their severity, while prolonged summer droughts, exacerbated by high stand densities, mistletoe and root disease infection, will likely lead to increased moisture stress and decreased health and vigor of forest trees making them more susceptible to mortality from such pathogens and insects (Battles et al. 2008).

Battles et al. (2008) evaluated the impacts of climate change on the mixed-conifer region in California providing insight to forest health and management implications for forest managers. This study found that changes in climate could "exacerbate forest health concerns" by increasing weakened tree susceptibility to mortality as a result of fire, disease epidemics and insect outbreaks and potentially enabling forest insects and disease to expand ranges or increase potential for widespread damage. The authors suggest that forest management strategies that increase species diversity, promote heterogeneity, and create lower density stands would be effective in providing "structures that are more resilient to catastrophic events like fire and epidemics" (Battles et al. 2008).

Predicted climate change is likely to impact trees growing in the Gibsonville area over the next 100 years. Although no Plumas National Forest specific climate change models are available at this time, there is a general consensus among California models that summers will be drier than they are currently. The risk of bark beetle caused tree mortality will likely increase for all conifer species under this scenario, especially drought intolerant white fir. Improving the resilience of stands to future disturbance events through density, size class and species composition management will be critical to maintaining a healthy forested landscape (Cluck 2014).

10.DETERMINATIONS

Refer to **Table 23** for a summary of effect determinations for wildlife species that potentially occur within the planning area and could be affected by implementation of the Gibsonville Fuels Reduction Project.The following determinations are based on the extent of habitat modification weighed against potential risk for habitat loss due to wildfires or disease.

10.1 Alternative A (No Action)

***Forest Sensitive Species with a May Effect Determination*:** It is my determination that the no action alternative may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability for the **California spotted owl, Northern goshawk, Pacific marten, Pallid bat, Townsend's big-eared bat, Fringed myotis and Western bumble bee**.

10.2 Alternatives B and C (Action Alternatives)

***Forest Sensitive Species with a May Affect Determination*:**It is my determination that AlternativesBand Cmay affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability for the**California spotted owl, Northern goshawk, Pacific marten, Pallid bat, Townsend's big-eared bat, Fringed myotis and Western bumble bee**.

For the California spotted owl, this determination is based primarily on:

- Alternatives B and C: CSO PACs would not be entered for mechanical thin treatment but would be for fuels reduction including mastication, HCP and underburn, and roadside hazard tree removal.
- Alternative C: Acres proposed for VDT 40% treatment are not within CSO Territories.
- Alternatives B and C: Design Features apply to both action alternatives, such as LOPs forCSO activity centers such as nests or roosts and riparian protection zones.

Table 23. Summer of effects for wildlife species which could be affected by the GibsonvilleHealthy Forest Restoration Project.

SPECIES	A	B	C
California spotted owl (*Strixoccidentalisoccidentalis*)	MAI	MAI	MAI
Northern goshawk (*Accipiter gentilis*)	MAI	MAI	MAI
Pacific marten (*Martescaurina*)	MAI	MAI	MAI
Pallid bat (*Antrozous pallidus*)	MAI	MAI	MAI
Townsend's big-eared bat (*Corynorhinustownsendii*)	MAI	MAI	MAI
Fringed myotis(*Myotisthysanodes*)	MAI	MAI	MAI
Western bumble bee (*Bombusoccidentalis*)	MAI	MAI	MAI

MAI = May Affect Individuals

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APPENDIX A

Sierra Nevada Forest Plan Amendment: Final Supplemental Environmental Impact Statement Record of Decision
Forest-wideStandards and Guidelines
(USDA Forest Service 2004)

Fire and Fuels Management

1. Strategically place area fuels treatments across the landscape to interrupt fire spread and achieve conditions that: (1) reduce the size and severity of wildfire and (2) result in stand densities necessary for healthy forests during drought conditions. Complete a landscape-level design of area treatment patterns prior to project-level analysis. Develop treatment patterns using a collaborative, multi-stakeholder approach. Determine the size, location, and orientation of area fuels treatments at a landscape-scale, using information about fire history, existing vegetation and fuels condition, prevailing wind direction, topography, suppression resources, attack times, and accessibility to design an effective treatment pattern. The spatial pattern of the treatments is designed to reduce rate of fire spread and fire intensity at the head of the fire.

   Strategic placement of fuels treatments should also consider objectives for locating treatment areas to overlap with areas of condition class 2 and 3, high density stands, and pockets of insect and disease. Avoid PACs to the greatest extent possible when locating area treatments. Incorporate areas that already contribute to wildfire behavior modification, including timber sales, burned areas, bodies of water, and barren ground, into the landscape treatment area pattern. Identify gaps in the landscape pattern where fire could spread at some undesired rate or direction and use treatments (including maintenance treatments and new fuels treatments) to fill identified gaps.

2. Vegetation within treatment areas should be modified to meet desired surface ladder, and crown fuel conditions as well as stand densities necessary for healthy forests during drought conditions. Site specific prescriptions should be designed to reduce fire intensity, rate of fire spread, crown fire potential, mortality in dominant and co-dominant trees, and tree density. Managers should consider such variables as the topographic location of the treatment area, slope steepness, predominant wind direction, and the amount and arrangement of surface, ladder, and crown fuels in developing fuels treatment prescriptions.

3. Where young plantations (generally Pacific Southwest Region size classes 0x, 1x, 2x) are included within area treatments, apply the necessary silvicultural and fuels reduction treatments to: (1) accelerate the development of key habitat and old forest characteristics, (2) increase stand heterogeneity, (3) promote hardwoods, and (4) reduce risk of loss to wildland fire. In size class 2x plantations, treatments should be designed to reduce fire intensity, rate of fire spread and tree mortality. Design a sequence of fuel reduction projects to achieve the standards below.

   Plantations (0x-2x):

   - 3 inches and smaller surface fuel load: less than 5 tons per acre,
   - less than 0.5 foot fuel bed depth,
   - stocking levels that provide well-spaced tree crowns (for example, approximately 200 trees per acre in 4 inch dbh trees),
   - less than 50 percent surface area with live fuels (brush), and
   - tree mortality less than 50 percent of the existing stocking under 90th percentile fire weather conditions (2x type only)

4. Design mechanical treatments in brush and shrub patches to remove the material necessary to achieve the following outcomes from wildland fire under 90th percentile fire weather conditions: (1) wildland fires would burn with an average flame length of 4 feet or less and (2) fire line production rates would be doubled. Treatments should be effective for more than 5 to 10 years.

5. Design a sequence of fuel reduction treatments in conifer forest types (including 3x plantation types) to achieve the following standards within the treatment area:

   • an average of 4-foot flame length under 90th percentile fire weather conditions.
   • surface and ladder fuels removed as needed to meet design criteria of less than 20 percent mortality in dominant and co-dominant trees under 90th percentile weather and fire behavior conditions.
   • tree crowns thinned to meet design criteria of less than 20 percent probability of initiation of crown fire under 90th percentile weather conditions.

Mechanical Thinning Treatments

6. For all mechanical thinning treatments, design projects to retain all live conifers 30 inches dbh or larger. Exceptions are allowed to meet needs for equipment operability.

7. For mechanical thinning treatments in mature forest habitat (CWHR types 4M, 4D, 5M, 5D, and 6) **outside WUI defense zones:**

   • Design projects to retain at least 40 percent of the existing basal area. The retained basal area should generally be comprised of the largest trees.

   • Where available, design projects to retain 5 percent or more of the total treatment area in lower layers composed of trees 6 to 24 inches dbh within the treatment unit.

   • Design projects to avoid reducing pre-existing canopy cover by more than 30 percent within the treatment unit. Percent is measured in absolute terms (for example, canopy cover at 80 percent should not be reduced below 50 percent.)

   • Within treatment units, at a minimum, the intent is to provide for an effective fuels treatment. Where existing vegetative conditions are at or near 40 percent canopy cover, projects are to be designed remove the material necessary to meet fire and fuels objectives.

   • **Within California spotted owl Home Range Core Areas:** Where existing vegetative conditions permit, design projects to retain at least 50 percent canopy cover averaged within the treatment unit. Exceptions are allowed in limited situations where additional trees must be removed to adequately reduce ladder fuels, provide sufficient spacing for equipment operations, or minimize re-entry. Where 50 percent canopy cover retention cannot be met for reasons described above, retain at least 40 percent canopy cover averaged within the treatment unit.

   - **Outside of California spotted owl Home Range Core Areas:** Where existing vegetative conditions permit, design projects to retain at least 50 percent canopy cover within the treatment unit. Exceptions are allowed where project objectives require additional canopy modification (such as the need to adequately reduce ladder fuels, provide for safe and efficient equipment operations, minimize re-entry, design cost efficient treatments, and/or significantly reduce stand density.) Where canopy cover must be reduced below 50 percent, retain at least 40 percent canopy cover averaged within the treatment unit.

- **Within California spotted owl PACs**, where treatment is necessary, remove only material needed to meet project fuels objectives. Focus on removal of surface and ladder fuels.

The standards in the bulleted list above *do not apply* to the eastside pine type.

8. For mechanical thinning treatments **outside defense zones in the eastside pine type:** in mature forest habitat (CWHR types 4M, 4D, 5M, 5D, and 6), design projects to retain 30 percent of the existing basal area. The retained basal area should be generally comprised of the largest trees. Projects in the eastside pine type have no canopy cover retention standards and guidelines.
9. Standards and guidelines # 6, 7, and 8 above apply only to mechanical thinning harvests specifically designed to meet objectives for treating fuels and/or controlling stand densities.

Snags and Down Woody Material

10. Determine down woody material retention levels on an individual project basis, based on desired conditions. Emphasize retention of wood in the largest size classes and in decay classes 1, 2, and 3. Consider the effects of follow-up prescribed fire in achieving desired down woody material retention levels.
11. Determine snag retention levels on an individual project basis for vegetation treatments. Design projects to implement and sustain a generally continuous supply of snags and live decadent trees suitable for cavity nesting wildlife across a landscape. Retain some mid- and large diameter live trees that are currently in decline, have substantial wood defect, or that have desirable characteristics (teakettle branches, large diameter broken top, large cavities in the bole) to serve as future replacement snags and to provide nesting structure. When determining snag retention levels and locations, consider land allocation, desired condition, landscape position, potential prescribed burning and fire suppression line locations, and site conditions (such as riparian areas and ridge tops), avoiding uniformity across large areas.

General guidelines for large-snag retention are as follows:

- westside mixed conifer and ponderosa pine types - four of the largest snags per acre
- red fir forest type - six of the largest snags per acre
- eastside pine and eastside mixed conifer forest types - three of the largest snags per acre
- westside hardwood ecosystems - four of the largest snags (hardwood or conifer) per acre
- where standing live hardwood trees lack dead branches - six of the largest snags per acre (where they exist to supplement wildlife needs for dead material).

Use snags larger than 15 inches dbh to meet this guideline. Snags should be clumped and distributed irregularly across the treatment units. Consider leaving fewer snags strategically located in treatment areas within the Wildland Urban Interface (WUI). When some snags are expected to be lost due to hazard removal or the effects of prescribed fire, consider these potential losses during project planning to achieve desired snag retention levels.

Obliteration would include, at the least, blocking the ends of the roads to traffic, but may include culvert removal, sub-soiling, recontouring, revegetation, and removing fill from stream crossings. Some of these routes may first be used during the project activities. Temporary roads constructed as part of this project would be closed with a constructed barrier after use. Temporary road surfaces

would be subsoiled to a depth of 18 inches to restore hydrologic function and the road area would be re-contoured to match slopes of the surrounding natural landscape.

Tree Species Composition

12.Promote shade intolerant pines (sugar and Ponderosa) and hardwoods.

Salvage

15.Use the best available information for identifying dead and dying trees for salvage purposes as developed by the Pacific Southwest Region Forest Health Protection Staff.

Habitat Connectivity for Old Forest Associated Species

27. Minimize old forest habitat fragmentation. Assess potential impacts of fragmentation on old forest associated species (particularly fisher and marten) in biological evaluations.

28. Assess the potential impact of projects on the connectivity of habitat for old forest associated species.

29. Consider retaining forested linkages (with canopy cover greater than 40 percent) that are interconnected via riparian areas and ridgetop saddles during project-level analysis.

30. If fishers are detected outside the southern Sierra fisher conservation area, evaluate habitat conditions and implement appropriate mitigation measures to retain suitable habitat within the estimated home range. Institute project-level surveys over the appropriate area, as determined by an interdisciplinary team.

31. Identify areas for acquisition, exchange, or conservation easements to enhance connectivity of habitat for old forest associated species.

California Spotted Owl Surveys

33. Conduct surveys in compliance with the Pacific Southwest Region's survey protocols during the planning process when proposed vegetation treatments are likely to reduce habitat quality in suitable California spotted owl habitat with unknown occupancy. Designate California spotted owl protected activity centers (PACs) where appropriate based on survey results.

Northern Goshawk Surveys

34. Conduct surveys in compliance with the Pacific Southwest Region's survey protocols during the planning process when vegetation treatments are likely to reduce habitat quality are proposed in suitable northern goshawk nesting habitat that is not within an existing California spotted owl or northern goshawk PAC. Suitable northern goshawk nesting habitat is defined based on the survey protocol.

Road Construction, Reconstruction, and Relocation

70. To protect watershed resources, meet the following standards for road construction, road reconstruction, and road relocation: (1) design new stream crossings and replacement stream crossings for at least the 100-year flood, including bedload and debris; (2) design stream crossings to minimize

the diversion of streamflow out of the channel and down the road in the event of a crossing failure; (3) design stream crossings to minimize disruption of natural hydrologic flow paths, including minimizing diversion of streamflow and interception of surface and subsurface water; (4) avoid wetlands or minimize effects to natural flow patterns in wetlands; and (5) avoid road construction in meadows.

Standards and Guidelines for California Spotted Owl and Northern Goshawk Protected Activity Centers

71. Within the assessment area or watershed, locate fuels treatments to minimize impacts to PACs. PACs may be re-mapped during project planning to avoid intersections with treatment areas, provided that the re-mapped PACs contain habitat of equal quality and include known nest sites and important roost sites. Document PAC adjustments in biological evaluations.

    When treatment areas must intersect PACs and choices can be made about which PACs to enter, use the following criteria to preferentially avoid PACs that have the highest likely contribution to owl productivity.

    - **lowest contribution to productivity:** PACs presently unoccupied and historically occupied by territorial singles only.
    - PACs presently unoccupied and historically occupied by pairs,
    - PACs presently occupied by territorial singles,
    - PACs presently occupied by pairs,
    - **highest contribution to productivity:** PACs currently or historically reproductive.

    Historical occupancy is considered occupancy since 1990. Current occupancy is based on surveys consistent with survey protocol (March 1992) in the last 2-3 years prior to project planning. These dates were chosen to encompass the majority of survey efforts and to include breeding pulses in the early 1990s when many sites were found to be productive. When designing treatment unit intersections with PACs, limit treatment acres to those necessary to achieve strategic placement objectives and avoid treatments adjacent to nest stands whenever possible.

    If nesting or foraging habitat in PACs is mechanically treated, mitigate by adding acreage to the PAC equivalent to the treated acres using adjacent acres of comparable quality wherever possible.

72. Mechanical treatments may be conducted to meet fuels objectives in protected activity centers (PACs) located in WUI defense zones. In PACs located in WUI threat zones, mechanical treatments are allowed where prescribed fire is not feasible and where avoiding PACs would significantly compromise the overall effectiveness of the landscape fire and fuels strategy. Mechanical treatments should be designed to maintain habitat structure and function of the PAC.

73. While mechanical treatments may be conducted in protected activity centers (PACs) located in WUI defense zones and, in some cases, threat zones, they are prohibited within a 500-foot radius buffer around a spotted owl activity center within the designated PAC. Prescribed burning is allowed within the 500-foot radius buffer. Hand treatments, including handline construction, tree pruning, and cutting of small trees (less than 6 inches dbh), may be conducted prior to burning as needed to protect important elements of owl habitat. Treatments in the remainder of the PAC use the forest-wide standards and guidelines for mechanical thinning.

74. In PACs located outside the WUI, limit stand-altering activities to reducing surface and ladder fuels through prescribed fire treatments. In forested stands with overstory trees 11 inches dbh and greater,

design prescribed fire treatments to have an average flame length of 4 feet or less. Hand treatments, including handline construction, tree pruning, and cutting of small trees (less than 6 inches dbh), may be conducted prior to burning as needed to protect important elements of owl habitat.

75. **For California spotted owl PACs:** Maintain a limited operating period (LOP), prohibiting vegetation treatments within approximately ¼ mile of the activity center during the breeding season (March 1 through August 31), unless surveys confirm that California spotted owls are not nesting. Prior to implementing activities within or adjacent to a California spotted owl PAC and the location of the nest site or activity center is uncertain, conduct surveys to establish or confirm the location of the nest or activity center.

76. **For northern goshawk PACs:** Maintain a limited operating period (LOP), prohibiting vegetation treatments within approximately ¼ mile of the nest site during the breeding season (February 15 through September 15) unless surveys confirm that northern goshawks are not nesting. If the nest stand within a protected activity center (PAC) is unknown, either apply the LOP to a ¼- mile area surrounding the PAC, or survey to determine the nest stand location.

77. The LOP may be waived for vegetation treatments of limited scope and duration, when a biological evaluation determines that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing and specific location. Where a biological evaluation concludes that a nest site would be shielded from planned activities by topographic features that would minimize disturbance, the LOP buffer distance may be modified.

78. Breeding season limited operating period restrictions may be waived, where necessary, to allow for use of early season prescribed fire in up to 5 percent of **California spotted owl PACs** per year on a forest.

79. Breeding season limited operating period restrictions may be waived, where necessary, to allow for use of early season prescribed fire in up to 5 percent of **northern goshawk PACs** per year on a forest.

80. **For California spotted owl PACs:** Conduct vegetation treatments in no more than 5 percent per year and 10 percent per decade of the acres in California spotted owl PACs in the 11 Sierra Nevada national forests. Monitor the number of PACs treated at a bioregional scale.

81. **For Northern goshawk PACs:** Conduct mechanical treatments in no more than 5 percent per year and 10 percent per decade of the acres in northern goshawk PACs in the 11 Sierra Nevada national forests.

82. Mitigate impacts where there is documented evidence of disturbance to the nest site from existing recreation, off highway vehicle route, trail, and road uses (including road maintenance). Evaluate proposals for new roads, trails, off highway vehicle routes, and recreational and other developments for their potential to disturb nest sites.

Standards and Guidelines for Marten Den Sites

88. Protect marten den site buffers from disturbance from vegetation treatments with a limited operating period (LOP) from May 1 through July 31 as long as habitat remains suitable or until another Regionally-approved management strategy is implemented. The LOP may be waived for individual projects of limited scope and duration, when a biological evaluation documents that such projects

are unlikely to result in breeding disturbance considering their intensity, duration, timing, and specific location.

89. Mitigate impacts where there is documented evidence of disturbance to the den site from existing recreation, off highway vehicle route, trail, and road uses (including road maintenance). Evaluate proposals for new roads, trails, off highway vehicle routes, and recreational and other developments for their potential to disturb den sites.

Standards and Guidelines for Riparian Conservation Areas and Critical Aquatic Refuges

Refer to Gibsonville Aquatic BEBA 2016 for S&GLs for RCAs.